RAILROAD GAZETTE

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Contributions.

Some Railroaders of 1850.

Muncie, Ind.

To the Editor of the Railroad Gazette:

In reading your valuable paper I have noticed from time to time various appliances for connecting turnouts with main tracks, as well as numerous other things which are interesting to a man who has followed railroading from the inception of the railroad era in the West down to the present time. It has occurred to me, therefore, to give you a bit of history, suggested by a recent article, and which I will take the liberty to illustrate by the sketch shown below.

I may be allowed, perhaps, to preface this with a few reminiscences. In my early life I spent a number of years in delivering locomotives from the shops to western railroads. I can well remember when engines were built at Matteawan, N. Y.; several were made at that place. The old Blossburg road out of Corning, N. Y., had two of them, I believe. The Long Island road had one, with three frames. On the Amboy road I well recollect seeing at the shops below Bordentown the old "Quill Wheels"—English engines—with fire boxes sloping at the back end, and built up driving wheels, with cast iron hubs. The cranks of the axle terminated where the wrist pin of to-day is placed. I well remember when the "Abner Chichester" was built for the old Erie road, before the track had been laid as far as Sufferns.

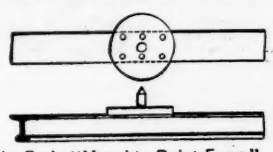
In those days the works of Rogers, Ketchum & Grosvenor, now the Rogers Locomotive Works, constituted a prominent feature of the American railroad world. The establishment was presided over by William Swinburn, and the Cookes, the founders of the present Cooke Locomotive Works, at Paterson, N. J., were the pattern makers on locomotives at the R., K. & G. shops. George Hollingsworth was then a prominent man. He spent all the best portion of his life travelling for the Rogers Company. He went all over this hemisphere, and probably had more multifarious railroad experiences than any other man in the United States, having delivered a great many locomotives for that firm. Later he was with the Schenectady Locomotive Works, and I often met him on the railroads in the West. Other men in that business at that time were Hollingsworth, Hiram Mooke, of the Hinkley Works, Boston; Dyer Williams, James Seeth and Henry Beach.

Nearly all track was then laid on longitudinal sleepers, to which were fastened ribbons 1 in. by 3½ in., and on top of the ribbon were the old fashioned flat bars, making the "strap iron," so well known for its propensity to turn into a "snake head" occasionally. An interesting early railroad was that from Schenectady, N. Y., to Utica, of which William C. Young was Chief Engineer. David Matthews was Master Mechanic at Schenectady. The road from Syracuse to Utica was built under the direction of Oliver H. Lee, Chief Engineer, who afterwards had an office at 11 Cedar street, New York city.

In 1850 I took two locomotives to Wisconsin (formerly spelt Ouisconsin). I landed at Milwaukee, then a small trading village. I shipped the engines at Buffalo, putting one on the bark Abiah and the other on the schooner Patrick Henry. At Buffalo I stopped at the United States Hotel, kept by Z. Bonney. Arriving at Milwaukee it was found necessary to wait a week for the river to be dredged, but finally, on September 12, I was enabled to land the first locomotive which ever stood in the State of Wisconsin. This engine was named in honor of the State. A week later steam was raised, and the engine was started from a point where the Armour warehouse now stands. The first run was over a temporary track laid on some sharp curves to get around some piles of lumber and to reach the small shed on West Water street, opposite the old paper mill, by the Menominee River bridge. The officers of the road, with their wives and children, all piled on the tender. Among these were Jasper Vleit, Garrett Vleit, Daniel H. Richards, Byron Kilbourn and E. D. Holton. Mr. Edgerton was the active officer at Milwaukee, and Mr. Kilbourn was President and Chief Engineer. Thus was started the first railroad trip in Wisconsin.

The road on which this engine ran was a part of that built under the Gorman & Hackett contract, its name being the Milwaukee & Mississippi. It is now a part of the Chicago, Milwaukee & St. Paul. At this time the track of the Chicago & Galena, laid with strap rails, was being finished to St. Charles. Jack Ebberts and his brother Peter took out a locomotive for that road, called the "Whittlesey." This engine was built by Norris, at Bush Hill, Philadelphia. About the same time the same shops built the "Illinois" for that road. I remember meeting the "Illinois" at Michillimackina (now abbreviated to Mackinaw), as I was going back to Schenectady. C. M. Reid's line of steamers were the principal boats on the Lakes at that time. Every town had their posters, setting forth the sailing of "fast steamers," but nine to ten miles an hour was their highest speed.

But what I set out to tell you about was the first frog devised for the Milwaukee & Mississippi. It was in a temporary track laid to connect the railroad with the landing near the mouth of the Menominee River, where the rails were piled as they were taken from the vessels. I devised this frog, and Mr. Ratcliffe, a blacksmith, made it.



An Early "Movable Point Frog."

This bar did duty as a frog for a long time. It could be lifted from its place and transferred from one position to the other by two men. As navigation closed while I was at Milwaukee, I remained with the railroad company through the winter, running the engine while the track was laid to Wawatosa, six miles out. My fireman was Henry Morris, now a farmer in Blue Earth County, Minn.

I know not but this slight narrative of early railroading may interest some of the younger members of the fraternity. The old are being called to their fathers, most of them. Still some may live to peruse and enjoy recollections of early days.

WALTER S. PHELPS.

A Method of Examining Operating Expenses.*

By J. Shirley Eaton.

II.

MAINTENANCE OF EQUIPMENT.

1. Locomotive Repairs.
   - (a) Ordinary.
   - (b) Extraordinary—overhauling.
   - (c) Accident.*
2. Repairs of Cars.
   - (a) Passenger, ordinary.
   - (b) " extraordinary—renewal.
   - (c) " accident.*
   - (d) Freight, ordinary.
   - (e) " extraordinary—renewal.
   - (f) " accident.*
3. Tools and Machinery.
   - (a) Current Repairs.
   - (b) Extraordinary Repairs—renewals.
4. Stationery and Printing and Other Expense.
5. Superintendence.

*The statement being merely a memorandum of items, the duplication of figures for accident repairs is not improper.

Maintenance of Equipment is theoretically regulated by the rate of wear or use, but also in a considerable degree by the rate of renewal. For that reason the amount of the expense will be largely determined by the standard of maintenance.

ME-1. Locomotive Repairs possibly show a decrease for all services. It may be passenger and switch mileage are unusually heavy and freight is light, but the cost per mile for each service is high. Thus we have located a fault that had otherwise escaped attention altogether. But now let us compare the renewal expense, and we find it unusually heavy, and also the repairs due to accident are heavy, therefore we know that our ordinary repairs were cheaper this month. Roughly, we may say that our shop work was economical, but our transportation was careless and we have been bringing up the general standard of our motive power. It is well to keep track of this overhauling charge to see that it is not made the dump for other charges. By showing against the charge for overhauling, the number overhauled at each shop in periods of six months or a year, we may judge what shops are doing their work extravagantly. If we take our entire repair cost per engine mile annually, we can judge fairly of the real cost of engine repairs, because during so long a period there must be an average maintenance of standard. The engine mile is used as the basis for measuring our cost, and this will be fairly reliable so long as each service is kept separate.

ME-2. Repairs of Cars.—Passenger and freight cars should be kept separate, because they are entirely different things, outside of the fact that they contribute to revenue in different ways. These costs should likewise be examined as current repairs, overhauling and accident repairs. The distinctions as before must be inexact, but they afford information immeasurably better than none at all. If the expense of repairs of different kinds of freight cars is known to differ widely, it is well to keep them separate. Next to maintenance of way charges, car repairs can fluctuate most violently, according as the standard is maintained or let fall. Therefore, it is an exceedingly difficult account to judge. The number of cars overhauled should be placed against the cost and over considerable periods of time, examined by different divisions and shops to see where the poor work is being done. Current repair cost per mile is a partial index to the way cars are handled in yards, while accident repairs are chargeable directly to the Transportation Department. In order to note negligence, accident repairs should be noted against the division where the accident occurred. Bad handling about yards, resulting in minor damages to the cars, should be watched by a report of the number of such accidents, classified rudely at each large yard, although the cost of repairs could not be shown.

As the body of equipment gets old, the expense for car repairs per mile tends to become high. Also we must have an eye to the average car performance for the month. If cars are lying idle, or being bumped about terminals, or making short movements, their decreased mileage might not be offset by decrease of repairs.

ME-3. Tolls and Machinery expense is not an easy account to judge of, accurately. From time to time with better methods, the fixed plant of machinery will become larger and consequently its maintenance charge larger while the work that is done will be cheaper, because of the greater efficiency. But if very much cannot be made out of these figures at the general office, they are of the greatest use to the mechanical man. Over extended periods they enable him to judge of the efficiency of different types of machines.

ME-4. Stationery and Printing and Other Expenses are miscellaneous general charges. They may occasionally be delved into, each item sought out and held to the light in turn and a judgment formed about how they should run. But regularly, we may hardly do more than see that they keep at about the same figure from month to month, and this should not be large. If the road carries any shop employees' insurance or disburses any gratuities to the shopmen that are not a specific charge to some detail of the work, they should be kept as a separate item.

ME-5. Superintendence, like the same charge to other departments, is largely dependent upon general policies and the personality of individuals. Adjustments making increases cannot be judged in a single month. But it is very desirable to make periodical examinations into the cost for superintendence and the relative amount of the entire expenditure under this supervision, also to pick out the items which should reflect good or bad management as of renewals of engines and running repairs costs of both engines and cars. Reasonably approximate judgments may thus be had as to the expediency of the present scale of salaries.

MAINTENANCE OF WAY.

1. Repairs of Roadway.
   - (a) Superintendence.
   - (b) Ditching.
   - (c) Ballasting.
   - (d) Filling Trestles.
   - (e) Riprapping.
   - (f) Laying Rail.
   - (g) Replacing Ties.
   - (h) Repairs, snowsheds, &c.
   - (i) Trackwalking.
   - (k) Clearing Weeds.
   - (l) Scaling Cuts and Widening Embankments.
   - (m) Miscellaneous, including surfacing, lining and adjusting, &c.
   - (n) Contingencies—Extroardinary costs, as clearing snow, salting switches, repairing washouts, slides, &c.
2. Renewal of Rails—material. { (a) old by old.
3. Renewal of Ties. { (b) old by new.
   - (a) Main Line Cross Ties.
   - (b) Sidings, " "
   - (c) Sidings.
4. Repairs and Renewals of Bridges and Culverts.
   - (a) Ordinary.
   - (b) Renewal.
   - (c) Watching and Tending.
   - (d) Extraordinary expense due to contingencies.
5. Repairs and Renewals of Fences, Road Crossings, Signs, &c.
   - (a) Ordinary Repairs, fences.
   - (b) " " road crossings.
   - (c) " " cattle guards.
   - (d) " " overhead bridges.
   - (e) " " miscellaneous.

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(f) Renewals, fences.
(g) " road crossings.
(h) " cattle guards.
(i) " overhead bridges.
(j) Contingencies.

6. Repairs and Renewals of Buildings and Fixtures.
(a) Ordinary Repairs.
(b) Renewals, Depots, Line of Road.
" " terminals.
(c) Renewals, Coal Chutes.
(d) " Stock Pens.
(e) Renewal Water Stations.
(f) " Miscellaneous Buildings.
(g) Extraordinary, contingency costs.

7. Repairs and Renewals of Telegraph.
(a) Current Repairs.
(b) Tools.
(c) Renewals, Poles.
Station Outfits.
Batteries.
Wire.
(d) Contingencies, storms, &c.

Maintenance of Way fluctuates not with the rate of wear, but with the rate of renewal, which varies with the season of the year and has no reference to the month to month volume of business. Sometimes, for financial reasons, the amount of expenditure each month is made to conform rudely to the business done, and in this way to correspond to the earnings, but this conformity is artificial and must always tend to increase the cost of maintenance. However, the volume of business done does determine the required standard for speed and size of trains, and thus the amount of renewal per mile may be measurably determined, although the rate of renewal each month may vary. We compare the gross expense for maintenance against the same charge the same month of the previous year. To arrive at this gross expense, we should include all the costs of every kind for maintenance, which would be engine hire and car hire for all rolling stock used, that shall cover interest on first cost, depreciation and maintenance, quite as well as the current costs for train service and train supplies of work trains. So also it should include the interest on first cost and depreciation of steam shovels and other large items that have gone into the capital account, but are for the use of the maintenance of way and structures. In no other way can we follow the real cost of maintenance of way per mile of road. And the increasing use of larger tools, here, as in all other work, tends to make the direct costs less and less, and so far to vitiate our results for comparison. We look for explanation of the increase or decrease in the number of ties replaced, yards of rail renewed, or yards of ballast laid. Perhaps there will be some large single causes, as washouts, fires, train accidents on bridges or betterments, all of which should be temporarily withdrawn for the purpose of comparison. They should be studied by themselves. Next we must look into the several items in turn.

MW-1. Repairs of Roadway.—Superintendence has no relation to the general volume of business and may have no very direct relation to the general volume of maintenance charges. It is a salaried staff representing a certain potential that from month to month may not be proportioned exactly to the need, but in the long run bears a close relation to the volume of work done. It should be watched each month by itself. Increases should be accompanied by explanations, since they cannot be explained by the figures of expense. The line between superintendence and other charges must be in a measure arbitrary, but once drawn, must be adhered to. The account should be further divided into ditching, ballasting, filling, trestles, riprapping, laying rail, laying ties and repairs of snow sheds. The reasonableness of suchi miscellaneous costs cannot be more than guessed at. They should bear a tolerably uniform proportion among themselves. Attendant considerations of prevailing weather, general standard, of maintenance and condition of the road, whether old or new, single or double track, extensions, new policies or experimental methods must all be at hand to assist in judging of them. Whenever labor is applied exclusively under any one of these heads for renewals, it should be charged to the head to which applied. Against such charges we may set result units, as yards of embankment or ballast or riprap, feet of rail, sets of a switch ties, etc. But miscellaneous work, as here raising a low joint, there elevating a curve, surfacing, clearing weeds, scaling cuts, repairs of switches and frogs, should go into miscellaneous items against which we set no quantities of result

MW-2. Renewal of Rails, offers no information from month to month, except the cost per ton of rails used and the rate of renewal, preferably in per cent.

MW-3. Renewal of Ties depends also on the rate of renewal, though not to such an extent as in case of rails. The per cent. of renewal should be shown for cross and switch ties separately. New sidings involving new ties should be shown separately. If different kinds of ties are used, they should be shown separately.

MW-4. Repairs and Renewals of Bridges and Culverts should be shown where miscellaneous by kind of structure and where a definite replacement or renewal by bridge and art replaced. General costs for superintendence, etc., should be shown separately. Contingencies, as freshets, fires, etc., should be separated. Watching and tending should be a fixed figure and will bear occasional revision. Coal and supplies for draw bridge engines should be an approximately fixed figure. Renewals will be high or low, according to the percentage of each part or kind of bridge renewed, and will be expensive or cheap, according to the cost per unit renewed.

MW-5. Repairs and Renewals of Fences, Road Crossings, Signs, Etc.—This should not be a large account. It will vary both with the extent and cost of renewals, but also by reason of extensions which are required by County Commissioners. Comparisons of the gross cost per mile of road, between different sections of the same road or different roads are unsound, because the requirements are purely local and may vary greatly. Note the rate per unit of work done, the rate of renewal, and of extension.

MW-6. Repairs and Renewals of Buildings and Fixtures.—This is a difficult item to form any current judgment on, since the rate of renewal absolutely governs the monthly outlay and the work is of such a miscellaneous nature that units cannot be easily devised. Some judgment of the labor cost may be had by its ratio to the value of feet of lumber used. Further it will vary largely because of the addition of new buildings, as fuel stations, stock pens, switch houses, water stations, watch houses, tool houses, ice-houses, etc., that come with the betterment of the property and may not be charged to construction. Watch furniture and fixtures by itself. Apply the distinction Line of Road and Terminal to the renewal of depots. Repairs and Renewals of Docks and Wharves is generally an uncommon account. It should be separated into regular and extraordinary costs.

MW-7. Repairs and Renewals of Telegraph.—The cost of repairs and tools should be about the same for each month. Note the renewal of poles, station outfits, batteries and wire and the units of each renewed. Extraordinary expenses due to storms, should be withdrawn from the regular figures and noted by themselves. Charges for superintendence should be the same from month to month.

GENERAL EXPENSES.

1. Salaries of General Officers.
2. Salaries of Clerks and Attendants.
(a) Executive Office.
(b) Auditor's Office.
(c) Purchasing and Supply Department.
(d) Treasurer's Office.
3. General Office Expenses and Supplies (including stationery).
(a) Executive Office.
(b) Auditor's Office.
(c) Purchasing and Supply Department.
(d) Treasurer's Office.
4. General Office, Traveling Expenses, Private Cars, &c.
5. Law Expenses.
(a) Salaries.
(b) Expenses.
(c) Court Fees, legal expenses, &c. (ordinary).
(d) Extraordinary—special "legal expense."

General Expenses will be from six to ten per cent. of the entire expenses. Most of the items, like the detail charges of superintendence, can only be compared with the same charges at previous periods. We cannot compare them with the general volume of business, except over long periods and then only roughly.

G.E.-1. Salaries of general officers will bear the closest scrutiny at frequent intervals. But the individual plays a large part in this range of outlay—the salary of each man must be judged by itself, against his recognized capabilities. The aggregate of salaries which constitutes the total of this expense depends on the plan of organization followed, and cannot well be discussed by the statistician, though he may indicate where through the body of expenses changes affect other expenses. For monthly examination, nothing more can be done than to see that the salaries remain fixed and explain any differences under the head of differences in the rate of pay, differences of organization. If through the retirement of senior officers there are promotions, a memorandum of the aggregate of such increases of pay to the individuals should be noted, as it may have some bearing on the scale of salaries maintained.

G.E.-2. Salaries of Clerks and Attendants.—Where in the foregoing account we arranged our outlay by single salaries, we should here classifiy by departments or offices and watch to see that each has no increases or be ready to explain increases if found. As before, it is well to keep a memorandum of the amount of increases to individuals by promotions and the amount by office reorganization and of the decreases as well. Certain rough memorandum measures of the work in some of the offices may be applied at times to gage rudely the expenses against the results.

G.E.-3. General Office Expenses and Supplies, including stationery, should be watched with extra care. It should be carried under the head of the several offices incurring it.

Stationery and printing is a considerable item in the department of general expenses. It is an uncertain quantity for the reason that it is affected so greatly by changes in method which come irregularly and the benefit of which accrues to other accounts. The only classification of it is into new and existing forms which would tend to throw the largest irregularities into a subhead. The existing forms should run at about an even figure from month to month, and large items of new forms of stationery should be accompanied by explanations.

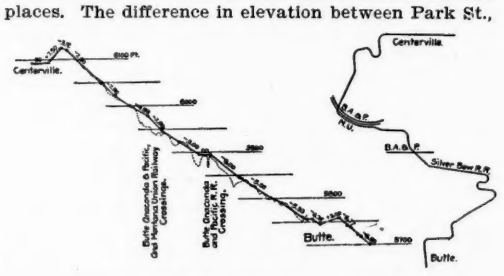
G.E.-4. General Office, Traveling Expenses and Private Cars, &c.—This is not in itself so important an account, but may be an index to larger things. It is an expense that is for a great part within the control of the officer incurring. It is not at all necessary to enforce parsimony, but it imparts a most healthful tone throughout the service to have this form of expense under strict surveillance. Increases requiring explanation can be located against departments and individuals.

G.E.-5.—Law Expenses.—The salaried part of this must be examined to see that there are no unexplained increases. The expenses should be shown separately and the legal expenses, court fees, etc., should be a third itemization. The first two items we may watch with tolerable certainty, but legal expenses are very uncertain. They must vary with the volume and nature of the work which may be very irregular and is not easily measured. These costs may be very diverse, so only they contribute to the same result. For instance, we recall the case of a special train run over to the court town and back through several days to carry witnesses, and the direct expenses of that train were charged to law expense. It is not a bad plan to separate the account to the class of cases to which they belong. In this way we are able to trace dimly some relation between this account and the loss, damage and injury accounts, according as cases are fought or compromised.

A Steep Grade Electric Railroad in Montana.

In a recent address before the Montana Society of Engineers, Mr. Francis W. Blackford gave an account of the work of changing the steep-grade cable road between Butte and Centerville, Montana, to an electric line. From his paper, printed in the Journal of the Association of Engineering Societies, the following facts have been prepared:

The cable road, which was of three-foot gage, was used exclusively for passenger service. It was built in 1897, and after about a year of service, plans were made to substitute electricity and to make the necessary changes in the alignment and grades. The cable was run in an almost direct line between the two places. The difference in elevation between Park St.,



Profile of Electric Road. *Route.*

Electric Road Between Butte and Centerville, Montana.

Butte and Center St., Centerville, a distance of 0.9 mile, is 390 ft., and the cable road had grades as steep as 14 per cent.

The plan of the new enterprise was to build a double-track electric railroad, with grades not exceeding 5 per cent., and laid out so as to accommodate as many people as possible living in the settlements between the two places.

Preliminary plans and trials were made in the summer of 1897, and the possibilities were pretty well understood before the final location was decided on. It was, however, found to be impracticable to adhere to a grade of 5 per cent., and in the final location grades of 6 and 7½ per cent. were introduced in places, with rates varying from level up to these, as shown by the accompanying profile.

The dotted line is a profile of the land along the route of the electric road. It may be seen from this that much bridging and filling was necessary in building the road. The route between Butte and Centerville is shown on the right in the engraving.

As the work progressed it was found that the right of way was of greater importance than the physical difficulties to be overcome. While farm and town or city property has a prety well established value, easily determined by testimony before a commission, the determination of the value of a piece of undeveloped mining property is a very different and a very difficult matter. The owner of such property can often prove the value of his surface ground, for use in the development of the mine, to be so great in a single instance as to practically kill such an enterprise; and the only thing to do in such cases is to avoid the property, or at least that part of it which is likely to be used for developing the mine.

The company's charter gave power to condemn land for a right of way, but it was thought best to locate the line on land which could be bought at reasonable prices.

The crossings of the three steam railroads were made overhead by steel spans or plate girders, the other crossings, four in number, were wooden bent trestles. While the latter contain no unusual feat-

ures, the plans were prepared especially for this work. They were plannd to carry "Jumbo" cars of 15 tons weight, with a load of 180 persons, or a total weight of 30 tons. The elevation of the track on curves was computed for a speed of 12 miles an hour.

The curves vary in radius from 64 to 143 ft., with transition curves at the ends increasing 10 deg. every 10 ft. upon the lighter curves and 10 deg. every 5 ft. upon the heavier ones. No compensation of grade on curves was made, because the power supplied to the cars was enough to enable them to ascend much steeper grades, the objection to the heavy grades being the difficulty in safely descending them. On this line, which overcomes an elevation of 416 ft., and has 1¾ miles of almost continuous grade, the safe descent is the special feature of its operation. Except on the paved streets of Butte, the road is laid throughout with 52-lb. second-hand steel rail that had been in use on the Oregon Short Line Ry. The rail was but little worn, and it makes an excellent track. The rails are bonded with the Atkinson horse-shoe bond, N 0000, cross-bonded every 600 ft. The power is transmited by an overhead wire, supported by cedar poles on each side. The feed wire, however, does not follow the meanderings of the road, but runs straight up the hill and feeds at the crossings and at the end of the line.

The road is supplied with 16-ft. single-truck cars, with 30-in. wheels, each car having two 35-h.p. G. E. No. 1,000 motors. In addition to the usual chain brake, the cars have the G. E. electric brake, the latter being used as an emergency brake only. They also have the G. E. K-10 controller. The trip from the corner of Park and Main streets, Butte, to the corner of Center and Main streets, Centerville, a distance of 1¾ miles, is made with ease in 15 minutes. Each car makes two round trips an hour. The line has been in successful operation since August 7, 1898, and no accidents or runaways have occurred. In only one instance has the emergency brake been applied.

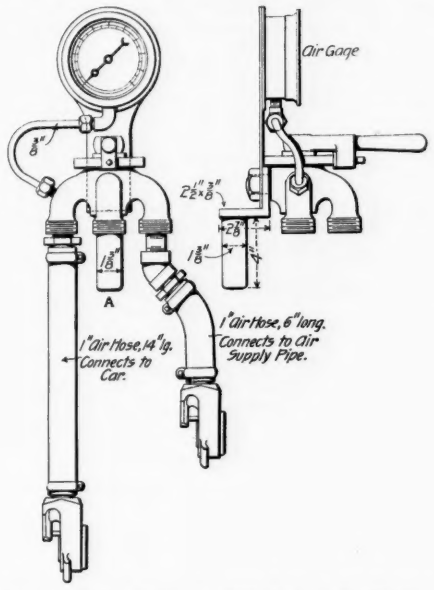
A Yard Installation for Testing Air Brakes.

The application of air brakes to a great number of freight cars has developed the necessity of having the apparatus in working order when trains are made up at terminals. This has brought out another problem to be solved, namely, the inspection and repairs of air brakes to make them available for service and to prevent detentions at terminal points. An examination of a number of trains composed of interchange air brake freight cars has shown that from 20 to 25 per cent. of them have brakes inoperative, and that the defects can only be discovered by actual test. Just what this test should be, when and where made, are parts of the problem.

On account of the impracticability of taking cars out of service to make shop tests, the storage and make-up tracks in the terminal yards remain as the available points, and the usually isolated position of these yards—being separated from points where power to generate air pressure is available—brings out the question of the most economical plant to erect, maintain and operate, that will furnish the required power for present needs and be sufficiently elastic for future developments. With this end in view, a plant has been installed at West Freight Yard, Wilmington, Del., on the Philadelphia, Wilmington & Baltimore.

There being no boiler power to operate air pumps available at all times, a Fairbanks, Morse & Co. combined gasoline engine and air compressor, developing 12 H. P. and capable of compressing 80 cu. ft. of free air per minute was installed. This, with the necessary pipe lines, outlet valves, hose connections and storage reservoirs, which reach all points in the yards where trains are made up, as shown in the general plan. From this plan it will be seen that the engine is placed in a room near the car inspectors' building, one of the car inspectors being detailed to look after the engine. As it has an automatic relief valve and is self-lubricating, the services of a regular engineman are not required. In this building are also two large storage reservoirs, from which the pipe lines radiate.

The pipe lines are generous in size, to act as reservoirs, as well as reduce friction, and to permit of considerable expansion of the system. To prevent deterioration the pipes are well painted, and encased in a wooden trunking neatly fitted. Each outlet is surrounded by a boxing with a movable lid, level with the ground surface, and is provided with a stop-cock and a standard air-brake hose coupler, this being the means of controlling the pressure and



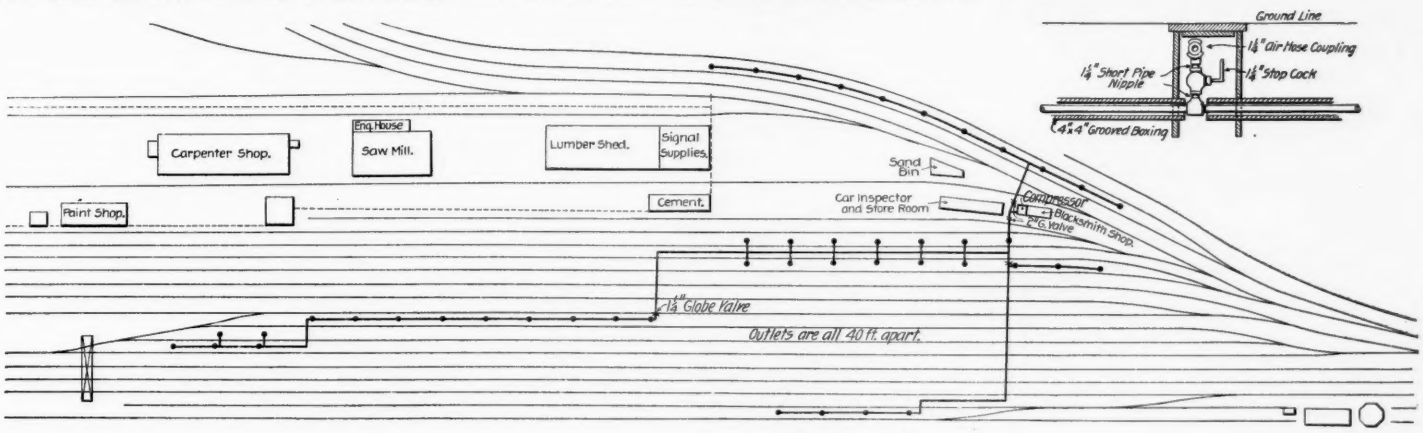
Gage and Couplings for Wilmington Air Testing Arrangement.

making connection to the cars to be tested through a 25-ft. section of hose, as shown in the detail on the same plate as the plan.

The pipe outlets are spaced 40 ft. apart in such sections of the yard as to make them available when required, without having the cars either separately or in trains, specially placed, the first outlet being as near to the head of the track as practicable, and the others following back as far as required.

In another engraving are shown the valve connections used in making the test. This is an ordinary three-way cock, with a top plate, which is milled out to indicate where the handle should be placed to give service and emergency applications, and for the release of brakes, the plug of the cock being cored with an additional hole so small that it will permit of making a service application, but not the emergency one. An air gage is also attached to indicate to the inspectors the train line pressure, and the reduction of air when the brakes are applied. By means of the pin shown at A it is attached to the car either at the coupler or the hand-holds.

The cost of operation is exceedingly small. On account of the small cost of installation, namely, $700, exclusive of the engine proper, and because of the protection given to the pipe lines, the interest and depreciation account remains at a minimum. The lubricants required are equal to the amount used on a steam engine of about the same size and running at the same speed, and the consumption of gasoline is determined by the actual amount of work done, when running at full-load capacity the consumption being about 1½ gallons of gasoline an hour. As the engine is fitted with an automatic unloading device, which relieves itself when the desired pressure is reached and runs light, the consumption of fuel decreases to about one-third of that when running under full load.



Air Brake Testing Arrangement—West Yard, Wilmington.—P., W. & B. R. R.

Train Accidents in the United States in January.

COLLISIONS.

Rear.

2d, on Baltimore & Ohio, near New Concord, O., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one. Several cars were wrecked and two tramps were killed.

3d, 1 a. m., on New York Central & Hudson River, near Clyde, N. Y., the rear portion of an eastbound freight train, which had been stopped because of the failure of a coupling, was run into at the rear by a following freight, and three cars were wrecked. A brakeman was fatally injured.

3d, on Cleveland, Cincinnati, Chicago & St. Louis, near Bellefontaine, O., a freight train ran over a misplaced switch and into some cars standing on a side track; eight cars were wrecked; engineman and fireman injured.

6th, 3 a. m., on Baltimore & Ohio, at Barnesville, O., a passenger train ran into the rear of a preceding freight in a tunnel, wrecking the caboose and several loaded freight cars, making a bad wreck. The wreck took fire and most of it was burned up.

7th, 5 a. m., on Baltimore & Ohio, at Hancock, Md., a freight train ran into the rear of a preceding freight, derailing 12 cars. The wreck took fire and was nearly all burned up. The engineman of the second train had fallen asleep.

12th, on Fitchburg road, near Conway Junction, Mass., a freight train which was backing into a side track was run into at the rear by a following freight, which approached on a descending grade at uncontrollable speed. A fireman was injured.

13th, 7 p. m., on South Side Elevated, near Madison avenue, Chicago, a passenger train ran into the rear of a preceding passenger train, which had been unexpectedly stopped, and several cars were badly broken at the ends. There was a dense fog at the time. One passsenger, one motorman and two other employees were injured.

14th, on Illinois Central, at Champaign, Ill., a passenger train ran over a misplaced switch and into a switching engine standing on a side track, badly damaging both engines. The engineman of the switching engine and the fireman of the passenger engine were killed. There was a dense fog at the time and the man who should have stopped the passenger train did not go out far enough.

16th, on Lake Shore & Michigan Southern, at Ashtabula, O., westbound mail train No. 15 ran into the rear of a preceding freight, wrecking the caboose and five freight cars. The fireman of the mail train was injured.

19th, 5 a. m., on Baltimore & Ohio, at Utica, O., a freight train standing at the station was run into at the rear by a following freight, and five cars were wrecked; engineman and fireman injured.

20th, 3 a. m., on Southern Pacific, at Lacoste, Tex., the westbound Sunset Limited Express ran over a misplaced switch and collided with an empty engine. The boiler of the empty engine exploded, making a bad wreck. The engineman of this engine and the fireman of the express were killed.

20th, on Baltimore & Ohio, near Claysville, Pa., a freight train ran into a work train, which was standing in a tunnel. Two employees were injured. It is said that the engineman of the freight must have misunderstood a caution signal which was given to him.

29th, 1 a. m., on Pennsylvania road, near Pittsburgh, Pa., a standing freight train was run into at the rear by a following freight, and four cars were wrecked. A brakeman was injured.

30th, 10 p. m., on Illinois Central, at Dyerville, Ia., a passenger train standing at the station was run into at the rear by a following freight, badly damaging several passenger cars and many freight cars. Two trainmen were injured.

31st, on Chicago Great Western, near Dodge Centre, Minn., a passenger train ran into the rear of a preceding freight at full speed, wrecking the passenger engine and three freight cars and killing the engineman and fireman. It appears that the freight train had been left unattended on a branch track at Hayfield Junction, and had been started by some cause unknown; and it had run several miles on the main line before the collision occurred.

And 29 others on 21 roads, involving six passenger and 45 freight and other trains.

Butting.

4th, on Canadian Pacific, at Mattawamkeag, Me., butting collision between a passenger train and a freight, damaging several cars. The steward of the dining car was injured.

8th, on Southern Railway, near Elk Valley, Tenn., butting collision between a northbound passenger train and a southbound freight train, the lattor drawn by two engines. Both trains were running at good speed. The three engines and many cars were completely wrecked and a large part of the combustible portion of the wreck took fire and was burned up. Four trainmen were killed and two injured. The collision was due to misreading of the timetable by the conductor and engineman of the

freight. They had notice that the passenger was 15 minutes late and they ran so as to reach Elk Valley before 11:30, the passenger being due at 11:15; but it was due at the next station north at that time, and was due at Elk Valley at 10:57.

9th, 5 a. m., on Union Pacific, at Sunol, Neb., butting collision between westbound passenger train No. 3, drawn by two engines, and eastbound passenger train No. 2, badly damaging both engines and several cars. In the westbound train two passenger cars and one baggage car took fire and were burned up, and the smoking car of No. 2 was badly damaged by fire. Two enginemen, one fireman and two passengers were killed, and five passengers and three employees were injured. The forward engineman of the westbound train is said to have been responsible for the collision.

9th, about 1 p. m., on Lehigh Valley, near West Dunellen, N. J., butting collision of passenger trains, both of which were running at full speed. The engines and one car were completely wrecked. Sixteen passengers were killed and 20 passengers and three trainmen were injured. The eastbound track of the road at this point was blocked by the wreck of a freight train, which had been derailed about 5 a. m. by a broken journal, and trains were being run in both directions on the westbound track for about six miles. The colliding trains were No. 71 westbound and third No. 20, eastbound. The westbound train consisted of three cars, and had only four passengers, all of whom escaped serious injury. The eastbound carried an excursion from Pennsylvania towns bound for New York. There was no baggage car, and when the collision occurred the tender of the engine penetrated about one-third the length of the foremost passenger car, which was well filled. The immediate cause of the collision was the failure of the operator at South Plainfield, the eastern end of the single track, to show the conductor of train 71 a holding order, which had been in force at his office for more than an hour. The operator, Butland, had just come on duty (at 12 o'clock). He delivered to the conductor and to the conductor of an engine which was to run to New Market (about two miles) ahead of No. 71, two orders which had to do with minor matters, but said nothing about the holding order. Mehaffey, the operator who went off duty (as operator) at 12 o'clock, remained in the office (signal cabin) as lever man; and as soon as he saw the orders delivered he cleared the train-order signal and allowed the engine and train No. 71 to go. He did this without asking Butland for authority. Butland sat with his back to the track, and, it appears, neither saw nor heard the trains start. The standard code is used by the Lehigh Valley, but the train dispatcher in this case violated the rule under Form J, forbidding him to depend exclusively upon a holding order to hold a superior train. He sent an order to the eastbound train without sending a duplicate of it to the westbound.

10th, on Chicago, Rock Island & Pacific, near Council Bluffs, Ia., butting collision of freight trains, wrecking both engines and several cars. Three trainmen were killed. There was a dense fog at the time.

10th, on Western & Atlantic, near Kingston, Ga., butting collision of freight trains, badly damaging both engines and several cars. One trainman jumped off and was injured. The engineman of the southbound train forgot a meeting order which had been delivered to him.

13th, on Philadelphia & Reading, at Mortonville, Pa., butting collision of passenger trains; two passengers injured.

13th, on Norfolk & Western, near Higbys, O., butting collision of freight trains, badly damaging both engines; two trainmen injured. It is said that one of the enginemen had been on duty a long time and fell asleep.

15th, on Santa Fe Pacific, at Angell, Ariz., butting collision between a freight and a water train, the latter having approached this station, which was the appointed meeting place, at uncontrollable speed on a descending grade. Both engines and 12 cars were wrecked. One engineman was killed and three other trainmen were injured.

15th, on Pittsburgh, Cincinnati, Chicago & St. Louis, near Richmond, Ind., butting collision of freight trains, wrecking both engines and 13 cars. One of the engines exploded and the wreck took fire and was partly burned up. The collision is said to have been due to an oversight on the part of the conductor and engineman of the westbound train.

16th, on Cincinnati, Hamilton & Dayton, at Versailles, O., butting collision of passenger trains; two passengers injured.

16th, at Sharon, Pa., collision between switching engines of the Lake Shore & Michigan Southern and the Erie roads; both enginemen injured.

23d, on Chicago Great Western, at North Hanover, Ill., butting collision of freight trains, wrecking several cars and badly damaging the station building. One engineman, one fireman and one brakeman were killed. The eastbound train was standing at the station, it being expected that the westbound train would enter the side track.

29th, on Atchison, Topeka & Santa Fe, near Flagstaff, Ariz., butting collision of freight trains, each drawn by two engines. All of the engines were wrecked and four of the men on them were badly injured.

And nine others on nine roads, involving three passengers and 16 freight and other trains.

Crossing and Miscellaneous.

3d, at Marion, O., a switching engine of the Columbus, Hocking Valley & Toledo ran into a passenger train of the Columbus, Sandusky & Hocking at the crossing of the two roads, and one car was badly damaged; one trainman injured.

4th, 1 a. m., near Gray's Ferry, Philadelphia, Pa., collision between a passenger train of the Philadelphia & Reading and a freight of the Baltimore & Ohio, damaging one engine and two freight cars. A brakeman was killed. The passenger train had been signaled to run under control.

5th, on Chicago, Milwaukee & St. Paul, at Rondout, Wis., a passenger train ran into an empty engine standing at a coaling station, and both engines and one passenger car were damaged. Two employees and one passenger were injured.

9th, on Pittsburgh, Ft. Wayne & Chicago, at Allegheny, Pa., an eastbound freight train, which was moving from a siding to the main track was run into by another freight, moving in the same direction, and one engine and five cars were wrecked. A part of the wreck fouled the westbound main track and an engine on that track ran into it. Two firemen were injured.

13th, on Louisville & Nashville, near New Orleans, La., collision between a local freight train and a switching engine; one trainman injured.

15th, on Philadelphia & Reading, at Glenside, Pa., a freight train broke in two on an ascending grade and the rear portion ran down a grade and into the caboose of another freight, wrecking the caboose and several cars. The wreck took fire and was burned up. A brakeman in the caboose was burned to death.

16th, on Oregon Short Line, at Butte, Mont., a freight train ran over a misplaced switch and into a switching engine standing on the side track. Both engines and several cars were wrecked; conductor and fireman injured, the former fatally.

21st, on Chicago, Milwaukee & St. Paul, near New Ulm, Minn., a freight train ascending a grade broke in two and the rear portion ran back some distance and collided with a switching freight train, wrecking eight cars; three trainmen injured.

24th, 11 p. m., on Philadelphia, Wilmington & Baltimore, at Washington, D. C., a passenger train ran into a train of empty passenger cars which was being switched in the yard; one engineman killed.

26th, on Lehigh Valley, near Hazleton, Pa., collision between a freight train and an empty engine; one engineman killed and a fireman injured.

And 19 others on 17 roads, involving six passengers and 28 freight and other trains.

DERAILMENTS.

Defects of Road.

6th, 1 a. m., on Chicago Great Western, at Oneida, Ia., passenger train No. 1 was derailed by a broken rail and the engine was ditched; engineman, fireman and one passenger injured.

6th, on New York Central & Hudson River, at Herkimer, N. Y., a locomotive broke through a trestle bridge on a Y connecting the main line with the branch, the structure having been weakened by a flood. Three employees were thrown into the water and one of them was drowned.

7th, on Great Northern, near Hatton, N. D., a passenger train was derailed by a broken rail and three cars were ditched. The baggage car took fire and was burned up; conductor and five passengers injured.

15th, 5 a. m., on Baltimore & Ohio Southwestern, near Noble, Ill., the eastbound fast express was derailed by a broken rail, and three passenger cars were ditched. Nine passengers and one trainman were injured.

And six others on six roads, involving one passenger train and five freight trains.

Defects of Equipment.

19th, on St. Louis, Keokuk & Northwestern, at St. Louis, Mo., a switching engine was derailed by a broken wheel, and the fireman was injured.

25th, on Erie road, near Cattaraugus, N. Y., the caboose of a freight train was derailed by a drawbar, which was pulled out and fell upon the track. The conductor was killed and one brakeman was injured.

26th, on New York, Susquehanna & Western, near Stauffers, Pa., a freight train was derailed by a broken wheel, and four cars fell down a bank; a brakeman was injured.

And 14 others on 10 roads, involving 14 freight trains.

Negligence in Operating.

9th, on Denver & Rio Grande, near Mears Junction, Colo., a freight train became uncontrollable on a steep grade and jumped the track at a curve. Several cars fell down a high bank. Four trainmen were injured.

9th, on Philadelphia, Wilmington & Baltimore, near Magnolia, Md., a freight train ran into an open draw.

And two others, involving two freight trains.

Unforeseen Obstructions.

4th, 3 a. m., on Missouri Pacific, near Jefferson City, Mo., an eastbound passenger train was derailed by a landslide, and the engine fell into the Missouri River. The engineman and fireman jumped off and were killed.

4th, on Kansas City, Ft. Scott & Memphis, near Thayer, Mo., a passenger train was derailed, and the engine and two cars were overturned. The engineman was injured. It is said that the engine was derailed by a spike, which had been laid on the rail.

5th, on Illinois Central, near Grantsburg, Ill., a passenger train was derailed and three passenger cars were overturned and badly damaged. The conductor and four passengers were injured. It is said that the track had been weakened by a flood.

10th, on Fall Brook Railway, at Tiadaghton, Pa., the tender of the engine of a passenger train was wrecked by a large tree, which fell down from a high hill as the train was passing, and, with two cars, was thrown off the track. One of the passenger cars fell down a bank. Eight passengers were injured.

10th, 11 p. m., on Chicago, Burlington & Quincy, near Rock Rapids, Ia., a fast stock train was derailed by running over some horses, which had been caught on a cattle guard, and the engine and two cars fell down a bank. The fireman was injured.

11th, 9 p. m., on Southern Pacific, at Ingomar, Cal., the southbound night express was derailed by running over some sheep; the engineman was killed and a fireman was injured.

17th, on Baltimore & Ohio, at Shelby, O., a freight train moving backward was derailed by an obstruction on the track and the caboose and two cars were wrecked. A drover was injured.

24th, on Northern Pacific, near Cle Elum, Wash., a passenger train was derailed by a landslide, and the mail car took fire from an overturned lamp. Some of the mail was slightly damaged, but the fire was soon extinguished. The fireman was injured.

26th, on Northern Central, at Selinsgrove Junction, Pa., a freight train was derailed by a landslide and the fireman was fatally injured.

And 7 others on seven roads, involving three passenger and four freight trains.

Unexplained.

1st, on Ohio Central, at Sycamore, O., an empty engine, making a trial trip, was derailed and overturned, and the engineman was killed.

3d, on Georgia Railroad, near Brown's, Ga., a freight train was derailed and several cars were ditched; three trainmen injured.

7th, on Boston & Albany, near Pittsfield, Mass., a freight train was derailed and two cars were wrecked. A brakeman was injured.

13th, 11 p. m., on Kansas City, Ft. Scott & Memphis, near Gilmore, Ark., a freight train was derailed and the engine and nine cars were ditched. One man was killed and three trainmen were injured.

14th, on Atlantic Coast Line, near Benson, N. C., a freight train was derailed, and seven cars were ditched. A brakeman was killed.

14th, on Kansas City, Ft. Scott & Memphis, near Tyronza, Ark., a freight train was derailed and eight cars of horses were wrecked; engineman and one brakeman injured.

14th, 8 p. m., on Erie road, near Monk's, N. J., a special workmen's train was derailed at a curve, and the passsenger car fell down a bank and was wrecked. Two passengers were killed and 12 were injured.

21st, on Erie road, at Great Bend, Pa., eastbound passenger train (running at full speed) No. 8 was derailed and the engine and first two cars fell down a bank. A fireman off duty, riding on the engine, was killed, and the engineman and the other fireman were injured.

29th, on Ohio Southern, near Coalton, O., a passenger train was derailed and several cars fell down a bank. The engineman and fireman were killed and six passengers were injured.

30th, on Rutland road, near Larabee Point, Vt., a mixed train was derailed and the passenger car and one freight car fell down a bank. The passenger car took fire and was burned up. Two trainmen and four passengers were injured.

30th, on Southern Ry., near Waco, Ga., several cars in a freight train were derailed and ditched, and the conductor was injured.

31st, on Southern Pacific, at San Francisco, Cal., a passenger train was derailed and the engine was overturned; engineman and fireman badly injured. The engine was running with the tender foremost.

And 35 others on 27 roads, involving 35 freight trains.

OTHER ACCIDENTS.

3d, 2 a. m., on Philadelphia & Reading, near Bowers, Pa., the locomotive of a freight train was wrecked by the explosion of its boiler. The engineman was killed, and the conductor, fireman and one brakeman were injured, the conductor fatally.

7th, on Union Pacific, near Lookout, Wyo., the engine of the fast mail train was badly damaged by the breaking of a side rod and the engineman was killed.

16th, on Central of New Jersey, at Fanwood, N. J., the engine of an eastbound passenger train was badly damaged by the breaking of a driving axle and a parallel rod. The platform of the station was broken up and several persons standing on it were injured.

31st, 3 a. m., on Southern Railway, near Iuka, Miss., a baggage car in a train carrying soldiers was discovered to be on fire, and before it could be taken to a station it was entirely destroyed. The car contained cartridges and other ammunition, and there were numerous explosions, injuring 12 soldiers.

A summary will be found in another column.

Railroad Legislation.

Most of the State Legislatures now in session have nearly or quite stopped receiving new propositions, and the various bills heretofore reported in these columns are under discussion. As a rule, the results of the action of the Legislatures on bills affecting railroad interests can be satisfactorily reported only after the close of the session; but we note a few items which are of current interest.

The Legislature of Arkansas has established a State Railroad Commission, as heretofore noted, and the names of the first Commissioners are given in another column of this issue.

The Connecticut Legislature has passed a bill empowering the Railroad Commissioners to authorize the running of trains at any time on Sunday. At present all trains are forbidden between 10.30 a. m. and 3 p. m.

The Legislature of Delaware has passed a general corporation act, under which it will be as easy to secure mercantile charters in Delaware as it now is in New Jersey and West Virginia; and, in the opinion of some of the reporters, even easier. It appears, however, that in the case of a railroad corporation the persons desiring to obtain a charter must deposit with the State the sum of $2,000 for each mile of road to be built, the same to be paid back as each mile is completed. For the electric street roads the payment will be $500 a mile.

The Secretary of State of Indiana informs us that the Legislature of that State did not create a Railroad Commission.

In Michigan there has been passed a tax law requiring the property of railroad express, telegraph and telephone companies to be assessed the same as other property. Under this law the Governor has nominated three State Assessors. This law is spoken of as a triumph for Governor Pingree. Under it the assessors are to apply to the railroads a rate equal to the average of State, county and municipal tax rates throughout the State.

In Missouri a bill to make railroad fares two cents a mile, which appeared to be prospering, was defeated on the final vote. In the New York Legislature two bills to enlarge the powers of the Railroad Commissioners have been defeated; one of them required railroad mortgages to be approved by the Commissioners and the other forbade the extension of electric street roads without a certificate from the Commissioners that public convenience and necessity warranted the extension.

In North Carolina the Railroad Commission has been abolished and a Corporation Commission has been established in its place. This body will have supervision also over banks, building and loan asso-

ciations and sleeping car companies. The Commission has the powers of the court. North Carolina has a separate-car law, which goes into effect June 1. It requires separate, but equal, accommodations for the white and colored races, and applies to steamboat companies, but not to street railroads, nor to sleeping cars or through express trains. The Corporation Commission may exempt branch and narrow gage lines. In emergencies the conductor may set apart a portion of the car or compartment assigned to one race to passengers of the other. Section 4 requires that all railroad companies furnish first and second class passenger accommodations.

The Arizona Legislature has passed a law allowing all railroads which are exempt from taxation under existing laws to change their lines without forfeiting any rights, provided that no terminal point shall be changed; that no change shall be made that will increase the length of the road, and that no change shall be made except for the purpose of avoiding heavy grades and natural obstructions.

The Chicago Elevated Loop.

By Henry M. Sperry.

II.

Interlocking.

The interlocking installed on the Union Loop proper, by The National Switch and Signal Co., of Easton, Pa., consists of a plant at the inter-section of Van Buren street and Fifth avenue, known as Metropolitan Junction, to control the movements of the in-bound and out-bound Metropolitan trains; and a plant at the intersection of Van Burean street and Wabash avenue, known as South Side Junction, to control the movements of the in-bound and out-bound South Side trains. In addition to this there are five sets of diamond cross-overs for emergency movements. The size of these plants is shown by the following figures:

	Met. Jct.		S. S. Jct.		Cross-overs.	
	No.	Levers.	No.	Levers.	No.	Levers.
Switches	10	7	6	6	20	10
F. P. Locks	10	8	6	6	20	10
Detector bars	15	..	14	..	..	..
Torpedo Signals	10	..	9	..	..	..
Signals	12	12	9	9	30	20
Total Functions	57	..	44	..	70	..
" Levers	..	27	..	21	..	40
Spare spaces	..	5	..	3	..	0

Total functions, 171; total levers, 88; functions per lever, 1.94.

In addition to these plants, a change in the plant on the Lake street elevated at the intersection of Market and Lake streets, known as Bridge Junction, was made in order to provide for crossing trains on the Lake street road from right to left. At this point all incoming Lake street trains cross from right hand to left hand running, and after traversing the Loop, again cross at this point from left to right hand running. No delay has been experienced on this account. On the Metropolitan elevated a new plant had to be installed to control the four-track junction on Market street, just east of the River Bridge, the old plant for handling the terminal station being remodeled so as to simply control movements over the rolling lift bridge across the river. There is one feature of this plant that is unique, that is, the releasing lever. This was found necessary to relieve congestions of traffic when the river bridge is open. By means of this releasing lever a change can be made in the locking of the machine so as to permit movements that cannot be made under normal conditions of traffic. A set of

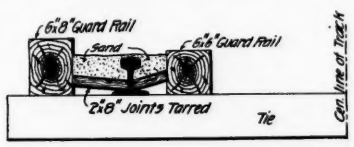


Fig. 8.—Sand Track, Union Elevated Railroad.

emergency cross-overs was also installed on Van Buren street, west of Franklin street station. The size of these plans is shown by the following:

	Bridge Jct. Lake St.		Market St. Metropolitan.		Crossover.	
	No.	Levers.	No.	Levers.	No.	Levers.
Switches	4	2	4	3	4	2
F. P. Locks	4	4	4	3	4	2
Detector bars	8	..	10	..	..	..
Torpedo Signals	4	..	5	4	..	..
Signals	..	..	..	..	..	4
Releasing lever	6	6	7	7	6	
Total Functions	26	..	31	..	14	..
" Levers	..	12	..	18	..	8

Total functions, 71; total levers, 38; functions per lever, 1.86.

A description of the plant at Metropolitan Junction will give a fair idea of the special features of all these plants. Fig. 7 shows the arrangement of the tracks and signals. The signals are of the dwarf pattern, and their height is such that no part of the post or arm reaches above the car windows, so that passengers leaning out are in no danger of being struck by signals. The signals displayed at night, are a red light for the stop position and a green light for the clear position; a white light being treated as a stop or danger signal. At the time the Union Loop was opened the Metropolitan was alone in using green for all-clear, but since then the Lake street and the South Side lines have both changed so as to make the signals conform to the plan used on the Loop.

In designing the interlocking, two questions had to be considered: first, safety of operation, and second, rapidity of movement.

The safety question has been solved by means of diverting switches, torpedo signals, and sand tracks, automatic stops and electric locking. Effective use is made of diverting switches. Derails proper could not be used with safety on an elevated structure. For an example of a diverting switch reference may be had to switches 17 and 19. The route from E to F for Metropolitan trains is protected by diverting Lake street trains into the sand track, at switch 17, and South Side trains are diverted by reversing switch 19. It will thus be seen that the Metropolitan in-bound movement is effectually guarded against collisions in a very simple and effective manner. If a Lake street or South Side train should disregard their respective signals and pay no attention to the explosion of the torpedo signals, it would still be impossible for them to run into a Metropolitan train. The movement from A to B is protected by an automatic stop and torpedo signal at E and by switch 19, which diverts trains at C. The movement corresponding to this at South Side Junction is further protected by diverting north-bound South Side trains into the sand track. The automatic stop at this point has but little use since the change in motive power from steam to electricity, as the engines equipped with the automatic stopping device were taken off, and the apparatus has not been applied to the motors. As a diverting switch is the best possible protection, an automatic stop could hardly be deemed necessary here. In a similar way the movement

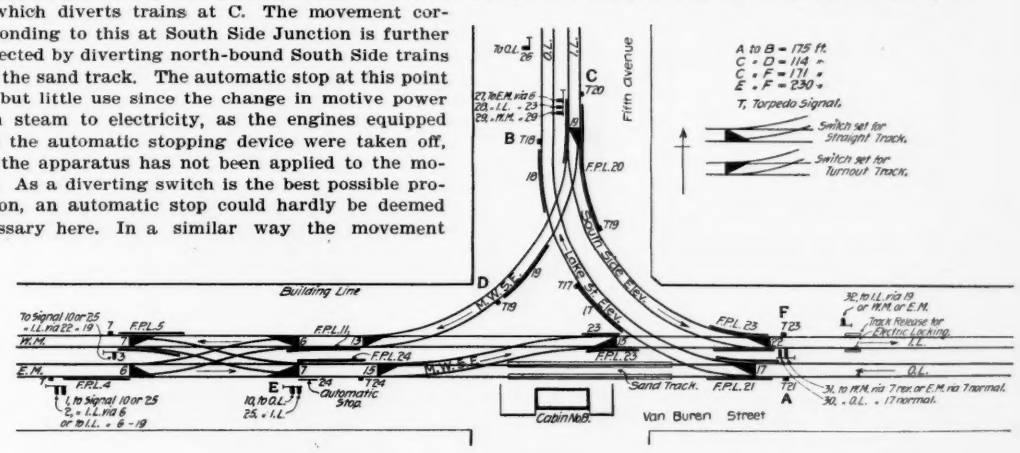


Fig. 7.—Metropolitan Junction—Union Elevated Railroad, Chicago.

REFERENCES.—*O L, Outer Loop Track; I L, Inner Loop Track; M W S E, Metropolitan West Side Elevated Railroad; W M, Westbound Metropolitan Track; E M, Eastbound Metropolitan Track; F P L, Facing Point Lock.*

from C to D is protected by setting switch 17 for the straight track.

In addition to arranging the locking so as to make the greatest possible use of the various switches for diverting traffic when a conflicting movement is being made, torpedo signals have been placed as shown, so that if a signal is over-run, the explosion of the torpedo calls instant attention to the fact.

To check the speed of trains that may have over-run their signal on the outer Loop track on Van Buren street a sand track has been built. This is shown in Fig. 8. This is modeled after the sand tracks in use in Germany. Guard rails are used to form the sides of the trough for holding the sand. This is believed to be the first use of a sand track in the United States. When necessary to make emergency movements from A to E (Fig. 7.), the sand is quickly leveled off and the track used as if no sand track existed.

To guard against the danger of changing a route after a train has once accepted it, electric locking has been put in on routes E F and C F so that after the controlling signal is cleared the train has to pass over a track release at F before the route can be changed. If necessary to throw this locking out of service to change the route, should a train stop, the releasing of the electric locking is accomplished by means of a hand release wheel, interlocked with the signal levers, which was fully described in the "Railroad Gazette" of March 11, 1898. A register has been added to indicate the number of times that this release wheel is used. To guide the signalman in determining which train has the right of way, the rule being that the train nearest to the junction and ready to move, shall go first, distance boards have been placed 300 ft. distant from the cabin, so that the first train passing one of these boards will be the first train to receive the signal, thus insuring an impartial handling of the traffic, which is one of the features that has to be considered in a terminal used by three different companies.

To insure ease of operation and reliability of action, facing point locks have been used throughout. Pipe lines are carried on steel supporters, and as little wood has been used as possible, all connections are of pipe. Pipe carriers are of the double anti-friction pattern.

The cabin is of a plain design with steel frame support for the machine, and is sheathed with galvanized iron. Windows are of the sliding pattern, so as to give the maximum of light with the minimum of woodwork. Complete equipment of tools and toilet facilities have also been provided.

Daly's Per Diem Car Service Plan.

At the meeting of the New York Railroad Club on March 16 the club continued the discussion of Mr. Daly's paper, which first came up at the February meeting, and which was reported in the "Railroad Gazette" of Feb. 17 and 24. In the absence of President Vreeland, the chair was occupied by Mr. C. M. Mendenhall (P. W. & B.), one of the vice presidents.

Mr. Sanderson (N. & W.) presented some notes showing the losses due to the present unscientific method of dealing with interchanged freight cars. A certain road using N. & W. cars paid for them, in three months, at averages of 44, 68 and 64 miles a day, but that road's cars on the N. & W. ran 53, 47 and 57 miles a day (average). In another case N. & W. cars lent made only only 10 miles a day, while the other road's cars on the N. & W. made over 20 miles a day.

In 1897 the N. & W. paid out for car mileage $35,000 more than it received, and in 1888 $53,000 more, and yet it constantly had fewer foreign cars on its road than there were of its own cars on foreign roads. Mr. Sanderson presented a diagram showing a computation of what should be a reasonable rate for hire of freight cars by the day. Taking the value of a car at $420, and computing the depreciation according to the M. C. B. table; estimating the repairs at $34 a year, and adding to these the interest at four per cent., a car costs about 22 cents a day. This omits taxes, superintendence, insurance and accounting. The most that is claimed for the estimate of repairs ($34) is that it is low enough. Mr. Yardley has estimated $60, Mr. Wheatly $43, Mr. Spalding $44.70, and the Interstate Commerce Commission $40. The rate of 15.6 cents a day, which has been favored in the American Railway Association, is based on 26 miles a day, the present assumed average, at six mills a mile. This rate, it will be seen, is too low; on the other hand, 25 cents a day is too high.

Mr. Cole (L. V.) spoke of some of the inequitable features of the present mileage plan. He believed it untrue that the large roads, the car owners, desired to retain the mileage system for the purpose of gaining or perpetuating an undue advantage over the small terminal roads. Neither do the small roads oppose per diem from narrow, selfish motives. The present plan, long entrenched in custom, and with transportation rates adjusted to it, is looked upon by these roads as their right. The enforcement of per diem would, however, compel these short lines to build cars sufficient for their share of the business.

Mr. W. F. Potter (L. I.) spoke of the difficulty of dealing with cars which are sent to foreign roads for traffic long before the traffic is ready. He cited a case where 5,000 New York Central freight cars were on a single small Western road at one time waiting for freight.

Mr. Conard asked if Mr. Daly's plan, not being pure per diem, would check the road which dishonestly reports less service than cars have actually performed. Several years ago an important road "cut" mileage on borrowed cars 200,000 miles in three months, and this road handled foreign cars a greater number of days than foreign roads handled its cars. The speaker also wanted to know how Mr. Daly could get around the objection that his plan imposes a penalty on switched cars. Again, transportation rates are based on distance; why should not the car service rate be computed on the same basis?

Mr. Daly replied to the questions and criticisms of the different speakers. Under straight per diem a road receiving a car at 1 a. m. and transporting it 100 miles and delivering it to the next road at 11 p. m. would have to pay nothing at all for the use of that car. But under the present compromise plan, in force on the Illinois Central and five other roads, it would have to pay something, the movement of all cars being added together to make up the average on which is based the per diem rate.

As to switched cars, the consignor or consignee

should pay demurrage for unreasonable detention, thus enabling the switching road to pay per diem. The Illinois Central would prefer straight per diem, but has adopted the compromise because it could be adopted. For 15 years the roads in this country have been unsuccessfully trying to agree on a uniform per diem rate. The variable rate now being tried will prevent 60 per cent. of the delays and irregularities due to the mileage plan; this in itself is an important saving, and the plan is a stepping stone to straight per diem. A lending road may want to introduce a fixed per diem rate, but it cannot dictate to the borrower. But with a per diem rate based on the miles made by the cars on the track of the road which pays the money, the rate thus being based on the time-honored mileage plan, the horrower has no ground for resisting, and he accepts the lender's proposition.

The I. C. would be $60,000 richer yearly if it could get 10 cents a day for its cars used on belt lines. At present the belt lines will not pay, because, they say, the Illinois Central and other large roads make similar movements of borrowed cars without paying anything.

Much is said about unavoidable delays at seaports and the impossibility of collecting a per diem rate on great quantities of grain held for ocean steamers. But the Illinois Central does a large export business at New Orleans, and it pays for borrowed cars by the day at that city the same as elsewhere. A Southern Pacific car going there with export freight is dealt with the same as it would be at any other place. Mr. Daly holds that he has no right to use another company's car as a storehouse there without paying for it. His road is practising what it preaches; it is building a new elevator to hold a million bushels of grain, and is spending a million dollars for new tracks and sheds and other improvements.

A per diem rate must be based on what cars are worth in the active season, when you want them, not on their value at dull times when you cannot get rid of them.

As to difficulties with the traffic department in sending large numbers of cars west to wait for grain; the traffic department itself suffers more by making this concession to shippers than it would if it uniformly denied all such demands. If cars must be sent to wait for freight the traffic department can waive the per diem charge, but thus far Mr. Daly's traffic department has not made any such request of him.

The only weak point in the present variable rate plan, based on mileage, is that it does not prevent cheating by a dishonest road. It does, however, reduce the profits made by the dishonest company.

It is not true that rates for the transportation of freight are based wholly on distance. A road originating a shipment and carrying it 50 miles, out of a total haul of 500 miles, does not accept 10 per cent. of the through rate as its share.

Eight-Wheel, Class H, Passenger Locomotive—Wabash Railroad.

The accompanying engraving shows an elevation of the new class H passenger locomotive of the Wabash Railroad, one of which has just been completed at the Springfield shops, while three others will shortly be built by the Rhode Island Locomotive Works. This locomotive was designed by Mr. J. B. Barnes, Superintendent of Motive Power and Machinery of that road, and has a smaller boiler and firebox than the class G, Atlantic type locomotive, illustrated in our issue of April 1, last, 18½x26 in. instead of 19x26 in. cylinders, but the same size driving wheels, 73 in., and practically the same tractive weight.

The boiler is of the radical stay, extended wagon top type, and is intended to carry 190 lbs. steam pressure. The metallic packing, bell ringer and the front end arrangement, which permits of the use of a short extension, are all Mr. Barnes' designs and are standard of the Wabash. The tender has diamond frame trucks with American cast steel bolsters and is unusually large for an engine of this size, the water capacity being 4,500 gallons and the coal capacity ten tons.

The following is a list of the principal general dimensions and the names of the makers of the special equipment:

Gage	4 ft. 8½ in.
Kind of fuel to be used	Illinois coal
Weight on drivers	79,000 lbs.
" " truck wheels	42,000 lbs.
" total	121,000 lbs.
" tender loaded	90,000 lbs.
Wheel base, total, of engine	24 ft. 5⅞ in.
" " driving	9 ft.
" " total (engine and tender)	47 ft. 1⅞ in.
Length over all, engine	34 ft. 8⅞ in.
" " " total, engine and tender	57 ft. 1⅜ in.
Height, center of boiler above rails	8 ft. 2 in.
" of stack, " "	15 ft.
Heating surface, firebox	165.9 sq. ft.
" " tubes	1,592.6 sq. ft.
" " total	1,758.5 sq. ft.
Grate area	18.04 sq. ft.
Drivers, diameter	73 in.
" material of centers	Cast steel
Truck wheels, diameter	33 in.
Journals, driving axle, size	8¼ x 10 in.
" truck " "	5½ x 9 in.
Main crank pin, size	6¾ x 5 in.
Cylinders, diameter	18½ in.
Piston, stroke	26 in.
" rod, diameter	3½ in.
Kind of piston rod packing	Metallic
Main rod, length center to center	8 ft.
Steam ports, length	18½ in.
" " width	1⅜ in.
Exhaust ports, length	18½ in.
" " width	3 in.
Bridge, width	1½ in.
Valves, kind of	Richardson balanced
" greatest travel	6 in.
" outside lap	1 in.
" inside lap or clearance	0 in.
" lead in full gear	¼ in.
Boiler, type of	Extended wagon top
" working steam pressure	190 lbs.
" material in barrel	Otis steel
" thickness of material in barrel	⅜ in.
" diameter of barrel	58 in.
Seams, kind of horizontal	Butt
" " circumferential	Lap
Thickness of tube sheets	⅝ in.
" " crown sheet	⅜ in.
Crown sheet stayed with	1⅛ in. radial stays
Dome, diameter	31 in.
Firebox, length	6 ft. 3⅜ in.
" width	2 ft. 10⅝ in.
" depth front	91 in.
" " back	91 in.
" material	Otis steel
" thickness of sheets	⅜ in.
" brick arch?	Yes
" water space, width—	Front, 4 in.; sides, 3½ in.; back, 4 in.
Grate, kind of	Finger rocking
Tubes, number	250
" material	Iron
" outside diameter	2 in.
" length over sheets	12 ft. 2⅛ in.
Smokebox, diameter	63¼ in.
" length	59¼ in.
Exhaust nozzle	Single
" "	Permanent
" " diameter	4½ in.
" " distance of tip above center of boiler,	1½ in.
Netting	Wire, No. 10
" size of mesh	2½ in.
Stack	Taper
" least diameter	12⅝ in.
" greatest diameter	17 in.
" height above smokebox	4 ft. 3 in.

Tender.

Type	Swivel trucks and steel frame
Tank capacity for water	4,500 gals.
Coal capacity	10 tons
Kind of material in tank	Steel
Thickness of tank sheets	¼ in.
Type of under-frame	Steel
Type of truck	Diamond frame
Truck with	Rigid bolster
Type of truck spring	Double elliptic
Diameter of truck wheels	36 in.
Diameter and length of axle journals	4¼ x 8 in.
Distance between centers of journals	6 ft. 3 in.
Diameter of wheel fit on axle	5⅝ in.
Diameter of center of axle	4⅝ in.
Truck bolster	American cast steel
Truck transom	Cast steel
Length of tank	19 ft. 6 in.
Width of tank	8 ft. 7 in.
Height of tank, not including collar	4 ft. 7½ in.
Height of tank over collar	6 ft. 1½ in.
Type of back drawhead	Gould long shank
With or without water scoop	Without

Names of Makers of Special Equipment.

Wheel centers	Sargent Co.
Tires	Midvale Steel Co.
Axles	Richmond Loco. Works
Sight-feed lubricators	Michigan Lubricator Co.
Bell Ringer	Wabash RR.
Front and back couplers	Gould Coupler Co.
Safety valve	Crosby Steam Gage & Valve Co.
Muffler	" " " " " "
Steam heat equipment	Gold Car Heating Co.
Standing devices	Western Ry. Eq. Co.
Injector	No. 9 and 10, Ohio Injector Co.
Driver brake equipment	American Brake Co.
Tender brake equipment	Westinghouse Air Brake Co.
Tender brake beam	Sterlingworth Ry. Supply Co.
Air pump	9½ in.—Westinghouse Air Brake Co.
Steam gages	Crosby Steam Gage & Valve Co.
Engine truck springs	Chas. Scott Spring Co.
Driving springs	" " " "
Tender springs	" " " "
Piston rod packings	Wabash RR.
Valve " "	" "

The Defects of the M. C. B. Coupler.

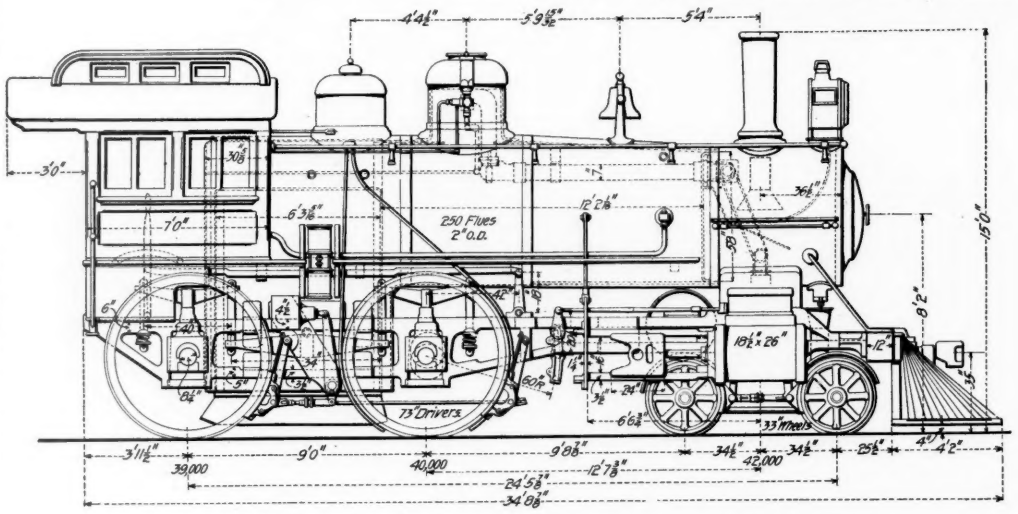
At the February meeting of the Western Railway Club a committee made a progress report on car couplers. This committee is made up of Messrs. Delano, Barr, Mackenzie, Peck and Fildes. The committee hopes to make its final report in April. Meantime, a revised table was presented as below, giving couplers in use, classified by groups.

Group I shows the M. C. B. coupler, of which there are more than 10,000 in use.

Group II shows the couplers of which there ar less than 10,000, but more than 1,000, in use.

This table cannot be said to be up to date, in th it is taken from the latest report of the statistician of the Interstate Commerce Commission, for the year ending June 30, 1897, and it is but fair to say that some of the couplers shown in Group II have advanced into the class shown in Group I and that some couplers not shown in either group might be named. In a general way, it is certainly a fair statement of facts. Group I includes nine different couplers, seven of which are in prominent use to-day. Group II includes 12 couplers, but the use of eight of these couplers is confined largely to the section of country where they are manufactured. There are 79 other couplers shown in the report of the statistician of the Interstate Commerce Commission, and which are not named. They would form Group III.

It will be the effort of your committee to show in its final report, wherein even the prominent manufacturers have departed from the original lines laid down by the M. C. B. Association, in some cases actually deviating from the contour lines, and in almost every case by ignoring the center lines laid down by the M. C. B. Association. There can be no question but that many of the faults to which couplers are heir could be eliminated if coupler manufacturers were required to make their new couplers conform accurately to the original M. C. B. standard. It is probably also advisable for the M. C. B. Association to carry the safety limit for guard arm something like three-fourths of an inch beyond its present termination.



Eight-Wheel, Class H, Passenger Locomotive—Wabash Railroad.

Group I.—10,000 or more in use.

American.	Janney.
Buckeye.	Standard.
California.	Trojan.
Chicago	Tower.
Gould.	

Group II.—Less than 10,000 and more than 1,000 in use.

Dowling.	St. Louis.
Hien.	Shickle, Harrison & Howard.
Hinson.	Smilie.
Janney-Buhoup.	Thurmond.
Lone Star.	Van Dorsten.
Mather.	Williams.
Pooley.	

Tests of the Corning Brake Shoe.

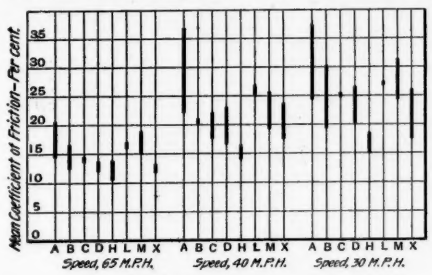
Laboratory tests of the Corning brake shoe have recently been made by Prof. Goss, on the M. C. B. brake shoe testing machine at Purdue University, to determine the frictional qualities, and the results indicate in a general way that the mean coefficient of friction on steel-tired wheels is similar to that of ordinary cast iron brake shoes.

This shoe, which is made by the Corning Brake Shoe Co., Corning, N. Y., and is now in use on a number of railroads, has a soft cast iron core made in one piece about which the main body of the shoe is cast. The body is of hard, tough iron, chilled on the face, so that the surface presented to the wheel is made up of about equal portions of chilled and of soft iron. The sides of the inset are so tapered from the back toward the face of the shoe that after the body is cast about it a section through the shoe shows a dove-tail joint. The claims made for this combination are that the chilled iron prevents rapid wear, while the frictional qualities are improved by the presence of the soft cast iron.

The shoes tested at Purdue were similar in form to those used in the M. C. B. tests of 1894-96, that is, they were approximately 13 in. long and had no flanges. The tests were made on a steel-tired wheel; three different braking pressures were used, namely, 6,831, 4,143 and 2,799 lbs., and stops were made from 65, 40 and 30 miles an hour, making in all nine sets of conditions. The corresponding braking pressures of the M. C. B. tests were 6,750, 4,000 and 2,798 lbs., but the differences are so small that direct comparisons can be made.

In all cases, at least three trials were made under

the same conditions of braking pressure and speed, while the methods of conducting the tests at Purdue were the same as those used in the M. C. B. tests, with one exception. In the M. C. B. tests all the trials of a series were made in sequence, whereas, in the tests at Purdue, each trial was made under different conditions of speed and pressure from those of the trial immediately preceding. Thus, trial No. 1 of a particular series might be made on a different day from No. 2 or No. 3. It is thought that this better eliminates the effect of local conditions, although a greater variation between individual tests of a group may reasonably be excepted. In the Corning tests, however, the results were fairly uniform, although in a few cases the average mean coefficient of a group



A = Soft cast iron brake shoe of the M. C. B. Tests.
B = Hard " " " "
C = Soft open-hearth steel brake shoe of the M. B. C. Tests.
D = Hard " " " "
H = Congdon " " " "
L = Soft pressed steel " " "
M = Wrought iron (pressed) " " "
X = Corning brake shoe tested at Purdue University.

Graphical Comparison of the Average Mean Coefficients of Friction of Different Brake Shoes.

has been lowered somewhat by what is evidently an erratic value. The average results of all the tests are given in the following table:

Summary of Average Results of the Corning Brake Shoe Tests.

Initial Speed. M. H. P.	Pressure on Shoe. Lbs.	Travel of Wheel. Ft.	Mean Pull. Lbs.	Mean C. of F. Per cent.	Initial C. of F. Per cent.	Final C. of F. Per cent.
65	6,831	1,866	798	11.7	23.0	21.3
65	4,143	2,780	447	10.8	15.2	25 1
65	2 799	3,643	366	13.1	16.1	29.4
40	6,831	465	1,199	17.6	16.9	25.5
40	4,143	590	921	22.3	21.0	28.6
40	2,799	738	659	23.6	22.5	28.6
30	6,831	250	1,204	17.6	15.8	25.0
30	4,143	310	892	21.5	19.3	27.7
30	2,799	419	727	26.0	25.8	32.6

In the diagram we have compared graphically the average mean coefficients of friction of the Corning shoe with similar coefficients of the different shoes used in the M. C. B. tests, in which diagram it will be noted that each vertical line represents a brake shoe. The results of tests on steel-tired wheels when stopping from 65, 40 and 30 miles an hour are plotted separately. The upper ends of the several heavy lines mark the average mean coefficients at 2,798 lbs. braking pressure, and the lower ends similar coefficients at 6,750 lbs. braking pressure. Intermediate pressures give values between these limits. It will be seen from this diagram that the Corning shoe gives a mean coefficient of friction practically the same as the hard cast iron, the steel and the Congdon shoes. It might be well to explain that the standard shoe (A) of the M. C. B. tests was cast wholly of soft pig iron, and was quite different from the so-called soft grey iron shoes used in service; the M. C. B. hard cast iron shoe (B) corresponds more nearly to the cast iron brake shoes commonly used.

Sample dynamometer records accompanying the report of these experiments show that the Corning shoe takes hold well near the beginning of the stop, especially at high speeds and gives a fairly uniform retardation throughout with only a moderate increase just before the wheel comes to rest.

The Resistance of Loaded and Empty Freight Cars

Judging from the practice of different roads which rate locomotives on a tonnage basis, there is a wide difference of opinion as to the relative resistance of loaded and empty freight cars. The committee of the Master Mechanics' Association, which reported on tonnage rating at the 1898 meeting, found that while several roads recognized no difference between empty, partially loaded and loaded cars in their ratings, others make various allowances, and in various ways. Thus one road reported that it allows 8 per cent. excess weight for empty cars, three roads 10 per cent., two roads 25 per cent., one road adds 5 tons and one assumes that such cars weigh 13 tons each. Such allowances as three empties to two loads, two to one, five to two, five to three and six to five were also reported. While a good part of this variation may be accounted for by the differences in local conditions, yet it is probable that many of these allowances are pure guesses and that in only a few cases have these relations been determined with any accuracy.

Mr. E. H. McHenry, Chief Engineer of the Northern Pacific, as the result of actual tests, using a dynamometer, decided that resistance per ton of empty cars on a level could safely be assumed to be 30 per cent. greater than an equal weight of fully loaded ones, and this factor has been embodied in the engine ratings for that road. Mr. Tracy Lyon, Master Mechanic of the Chicago Great Western, has also taken 30 per cent. as the excess resistance per ton of empty cars on level track, and shown that this excess resistance decreases on grades, being only 7 per cent. for a grade of 50 ft. per mile. That is, there is little difference between the resistance of light and heavy freight cars on moderate grades at low speeds, but a wide difference on the level at the speeds usually required on such sections.

As adding to the data on this subject and confirming this conclusion, the results of some interesting dynamometer tests made a few years ago are given in what follows. These results have never before been published, and we regret that now we are not permitted to give the name of the road upon which the tests were made. The work, however, was done under the direction of a careful and well-known engineer, and the results can safely be taken as reliable for the particular conditions described.

The object of the test was to ascertain the difference in resistance per ton of loaded, partially loaded and empty freight cars on grades and the level for purposes of engine rating. Eighteen "palace" stock cars were loaded with ties to the maximum capacity, and after a trip was made with this loaded train

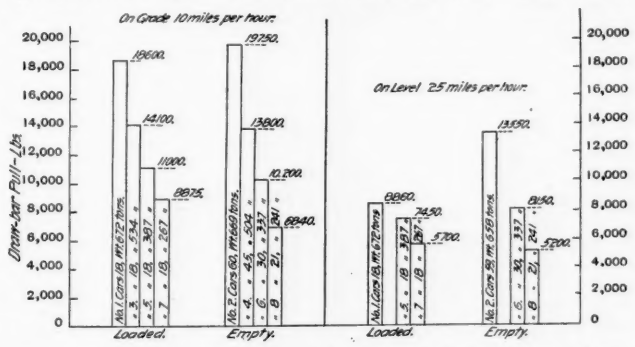


Fig. 2.—Average Drawbar Pull of Loaded and Empty Freight Cars.

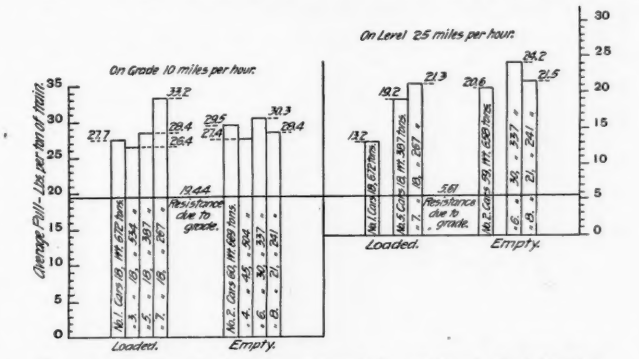


Fig. 3.—Average Resistance of Loaded and Empty Freight Cars.

on the grade and level, one-third of the ties were removed, leaving a two-thirds load. After a trip with that train, another one-third of the ties was removed, leaving a one-third load, and after a trip with that train they were all removed, leaving the empty cars, which were hauled over the course. Trains made up respectively of 60, 45, 30 and 21 old empty box cars were also tried, which were approximately of the same weight as the loaded and partially loaded stock car trains. The tests were numbered in the order in which they were made, a test on the grade and level with the stock cars being followed by the corresponding test with the empty box cars. In this way those with odd numbers are tests with stock cars, and those with even numbers the empty box car tests. The length of all these

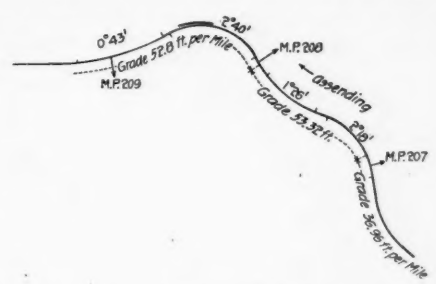


Fig. 1.—Alignment and Grades of Tracks Used in Dynamometer Tests.

trains and the total weights, including the dynamometer car, are given in the table.

The heavy trains were hauled by two locomotives. Trip No. 5 and subsequent ones were made with but one engine. The alignment and grades of the track used in the grade tests are shown in Fig. 1, and the records used were taken between mile posts 207 and 209. The so-called "level" stretch was between mile posts 212 and 214, and in reality was a slight ascending grade throughout; the first half mile was 10 ft. per mile, the second half mile 4.5 ft., followed by a short 28-ft. grade, while the remainder was 8 ft. per mile.

Trips 1 to 5 (on grade) were made on a day when the weather was cloudy and mild, the temperature 60 deg. Fahr., and the rail dry. The other tests were made on the following day, when the weather was clear, the temperature 35 deg. Fahr., the velocity of the wind about 20 miles per hour and the rail dry. The speed was obtained by readings from a Boyer speed recorder, and also the time of passing mile posts was taken by stop watches. In all the trials the speed was fairly constant. The observed and calculated data are given in the table, and are also shown graphically by Figs. 2 and 3.

The following general conclusions were drawn from these results:

"First—On grades of 1 per cent. or more, and when the speed is low or the wind pressure not excessive, the pull per ton of train of heavily loaded cars and a train of empty cars of the same approximate weight is practically the same.

"Second—On the level, where the speed is increased to 25 miles an hour, or the wind resistance is increased, the difference in the pull per ton of train of heavily loaded cars and a train of equivalent weight of empty cars is very great. Thus it was shown that while an engine might have pulled up the hill a train of 60 empty cars practically as easily as a train of 18 heavily loaded cars, yet on the level the tax on the engine to maintain a speed of 25 miles an hour with 59 empty cars was 67.8 per cent. of its capacity, as against 44.3 per cent. with the train of 18 loaded cars. It may be fairly doubted whether it is a practical thing to load an engine to so great a proportion of its capacity as 67.8 per

Average Resistance of Loaded and Empty Freight Cars—Speed on Grade 10 Miles an Hour; on Level 25 Miles an Hour.

Number of trip.	Number of cars.	Average lading per car. Lbs.	Total length of train. Ft.	Total weight of train. Tons.*	Dynamometer Record. Average drawbar pull. Lbs. Grade.	Average drawbar pull. Lbs. Level.	Maximum drawbar pull. Lbs. Grade.	Maximum drawbar pull. Lbs. Level.	Average resistance of train. Lbs. per ton. Grade.	Average resistance of train. Lbs. per ton. Level.	Average pull in per cent. of locomotive capacity. (20,000 lbs.) Grade.	Average pull in per cent. of locomotive capacity. (20,000 lbs.) Level	Time in seconds for two miles. Grade.	Time in seconds for two miles. Level.
1	18	43 261	689	672	18,600	8 860	22,630	12 600	27.7	13.2	93.	44.3	791	27
2	60†	Empty	1,928†	669†	19,750	13,550	22,300	15,950	29.5	20.6	98 7	67.8	769	28
						Difference.			1.8	7.4				
3	18	27,897	689	534	14,100	.....	17,450	.....	26.4	.....	70.5	.....	760	.....
4	45	Empty	1,440	504	13,900	15,300	.....	.....	27.4	.....	69.5	.....	747	.....
						Difference.			1.0	.....				
5	18	13 280	689	387	11.000	7,450	13 800	9,600	28.4	19.2	55.	37.2	792	290
6	30	Empty	953	337	10,200	8,150	12,000	10.350	30.3	21.2	51.	40.7	835	292
						Difference.			1.9	5.0				
7	18	Empty	689	267	8,875	5,700	10,800	8,000	33 2	21.3	44.4	28.5	830	284
8	21	Empty	673	241	6,840	5,200	8,800	6,600	28.4	21.5	34.2	26.0	793	288
						Difference.			4.8	0.2				

* Including the dynamometer car, but without the locomotive.
† No. 2 on the level consisted of 59 cars; length, 1,897 ft.; total weight, 658 tons.

cent. Hence, for grades not exceeding 1 per cent. the number of cars for trains of empty or lightly loaded cars is governed by the resistance imposed by speeds on the level, while the ratings for trains of heavily loaded cars is governed by the ruling grade. As the grade for any division exceeds 1 per cent., the factor of resistance due to grade becomes more important, while in proportion as the ruling grade amounts to less than 1 per cent., in that proportion do the other factors of speed and wind become more important. These explanations lead to a further conclusion.

"Third—That on divisions where the ruling gradients do not exceed 1 per cent. we must, in establishing a tonnage basis for rating engines, make a certain allowance for empty cars, or light loads, in order not to make excessive loads for the levels, where schedule speeds of 30 to 40 miles an hour are expected to be successfully maintained. Thus, comparing tests 1 and 2, 5 and 6 on a level we find that to the tonnage of empty cars we must add 50 per cent., and to the tonnage of cars having one-third load in them 30 per cent., to fairly compare their resistance on the level with loaded cars. For cars two-thirds loaded, we estimate that 10 per cent. should be added. This figure is estimated, because in trips 3 and 4, where the cars were loaded to two-thirds their capacity, unfortunately the test was not continued on the level.

"Fourth—As a preliminary rating, we would recommend the following:

"For empty cars, add 50 per cent to their weight.

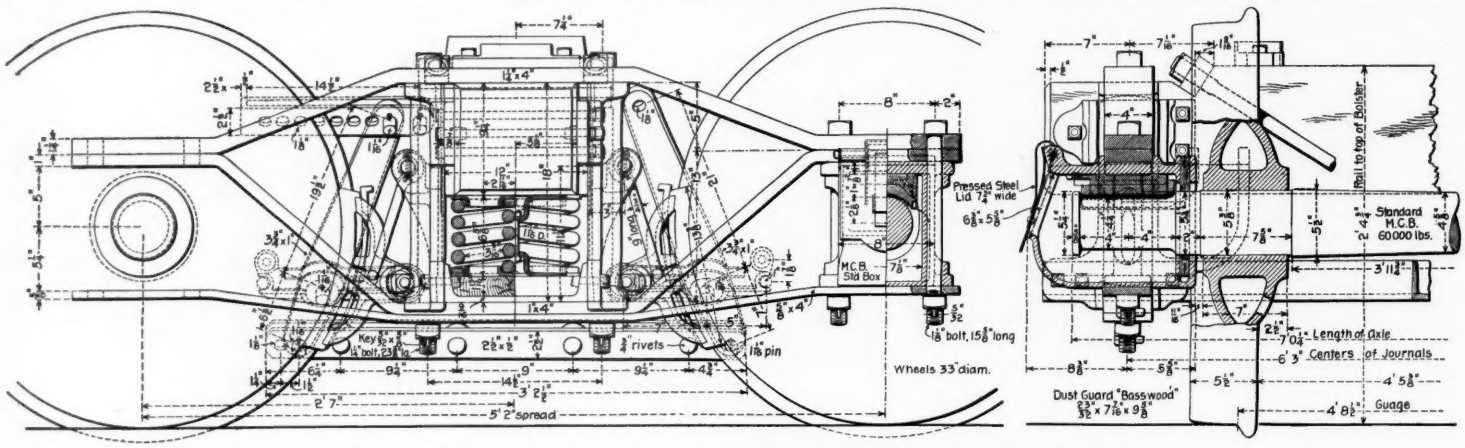
"For cars having one-third lading, add 30 per cent. to their weight.

"For cars having two-thirds lading, add 10 per cent. to their weight.

"The effect of speed and wind on the resistance of the trains, especially with a long train of empty cars, was so marked that we believe the resistance due to speed and wind is of much greater magnitude than is generally estimated, and it appears to be more important to ascertain the resistance of long freight trains at 30 or 40 miles an hour (or whatever may be regarded as the average speed of freight trains) than at the low speeds imposed by heavy gradients."

60,000 Lbs. Freight Car Truck of the Cleveland Cincinnati, Chicago & St. Louis.

The accompanying engravings show the details of the 60,000 lbs. capacity freigt car truck used by the Cleveland, Cincinnati, Chicago & St. Louis. It will be seen that this truck is of the diamond frame type, with a wooden, trussed bolster, 12 in. wide by 10½ in. deep, the spring plank is a 12 in. channel, and the brakes are hung from the column castings. The drawings show clearly the construction and the size of the various parts. In our issue of Feb. 17, last, the trucks of some recent 80,000 lbs. capacity coal cars for the same road were illustrated, with which pressed steel bolsters are used.



60,000 Lbs. Capacity Freight Car Truck of the Cleveland, Cincinnati, Chicago & St. Louis.

Freight Loading System at Richmond, Va.*

Plan of the Floor Space.

It is divided into spaces by numbered swinging signs, which indicate territories, on either side of which are separate wall signs for principal stations located in the territory indicated by the swinging signs. These swinging signs are numbered numerically, with not over two figures to each sign. One swinging sign near the centre of the shed should be used especially for the purpose of dumping all freight received from drays that is improperly marked, or is held for pre-pay, or for any other cause. The advantage of this central point for placing shipments that are held is, that where shippers are telephoned and send a man to make corrections or changes, it makes no difference whether he approaches the receiving clerk that called him or another; they all understand that such irregular shipments are sent to one central point, accompanied by the shipping-book or bills of lading. The errors can, therefore, be quickly rectified by any clerk.

Adjustment of the Cars.

There should be two or more parallel tracks the entire length of the shed on one side, equal distances apart, on which are placed cars to the full capacity of tracks, with doors directly opposite each other. The doors in the side of the shed opening into the cars should be spaced the length of a standard car from centre to centre.

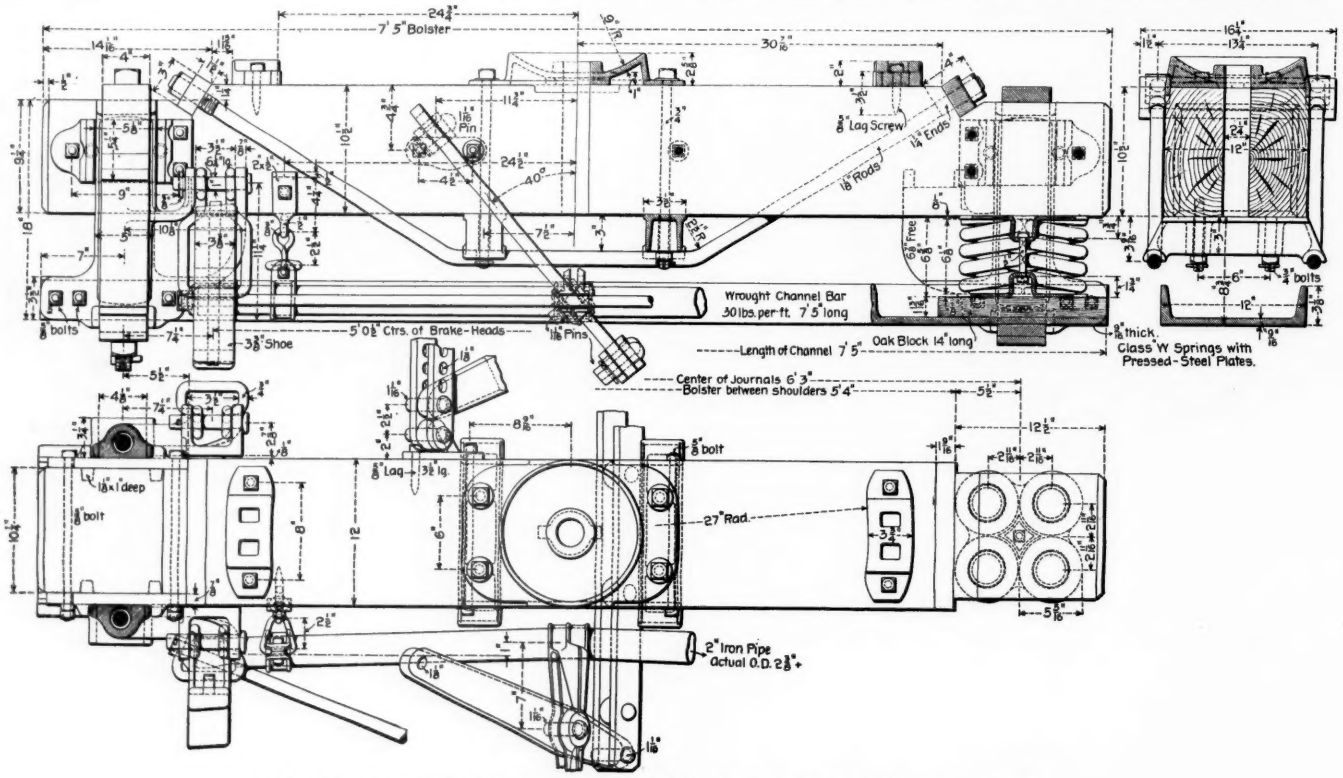
Between the doors of these cars on the different tracks should be placed gang-boards, consisting of iron strips with oak cross-pieces securely bolted. Each car reperesents a space. Each one of these spaces that a standard car occupies should be numbered; also each track, beginning with the first track next to the shed. We have four tracks, and we arrange the space numbers as follows:

Space Numbering of Cars.

We start with number one, at the first car at the yard end of the shed on the first track; the car opposite that on the second track is No. 2; third track, No. 3; fourth track, No. 4. Then we drop down to the next car on the first track, which is No. 5; the one opposite on the second track, No. 6; opposite that on the third track, No. 7; fourth track, No. 8; and so on down through the entire number of cars on the four tracks. Over the door of the shed entering any one of these cars we place, on a swinging sign, all four of the car-space numbers that are entered through that door. Take the first door—the sign over the entrance will read, 1, 2, 3, 4, in the order of their track location. Hung at the right-hand side of each car is a 12-inch square sign-board, with a hole at the top, bearing the space number. We have one of these numbered signs for each space, and by driving a small nail high up on the car-door, we can hang this sign in plain view of any truckman entering the car. Now we have the cars and signs ready for work.

Advantages in Placing Cars.

As the yard people become familiar with the space location of every car, it is an easy matter for them to place cars in the proper spaces for loading homeward via the junction point that we received them. Now, in deciding to what point we will load these space numbers each day, it will be necessary first to get the order in which trains are required to be made up, and load the cars on each track so there will be no unnecessary switching. The yard people can pull the entire track and place it in the train. Of course, where the volume of business varies to one particular territory, it may be necessary once in a while to



60,000 Lbs. Capacity Freight Car Truck of the Cleveland, Cincinnati, Chicago & St. Louis.

*By Edwin H. Lea, Freight Agent, Southern Railway, Richmond, Va., and President of the Southern Railway Agents' Association.

leave an empty on these tracks, which will mean an extra switch, but this cannot be avoided.

Adjustment of Floor Signs.

Now, when the car-space numbers have been assigned for loading to certain points, it will be necessary to so adjust the floor signs in the depot as to keep the bulk of your station order freight as near the cars in which you propose to load it as possible, as distance in trucking largely figures in the expense as well as the time.

Arrangement of Loading Force.

Now that the cars and shed are arranged, the trucking gang should be divided up according to the number of receiving and loading clerks. Each loading clerk should use one of his own initials to represent his gang, and each one of the truckmen in that gang should also be assigned a special letter or number; each gang having different letters, there should be no confusion. When one of the receiving celrks receives a shipment, he should enter on each bill of lading (that is retained for billing purposes) his gang letter, showing that he received it.

Checking and Loading.

As the articles come off the drays and are loaded on the trucks he should check in the proper place, opposite the articles loaded on the truck, with the initial of number of the truckman handling it, if the items are single items. Take a case of four barrels of flour, and it is "C" gang handling it, and "A" or No. 1 truckman takes the first two barrels; check should be "A," with two straight marks under it; the next two should be "B," with two straight marks under it. (All of this checking, understand, is on the bill of lading to be retained.) On the top barrel of flour, if it is going into space 15, should be marked the figures 15 with red chalk, and the truckman required to repeat that number back to the receiving clerk; they then take the barrels of flour to the car in 15 space.

Supposing one of these barrels check short, an examination of this ticket would show at once that the four barrels were carried away by two truckmen, one load each, and goes to prove that this shortage did not occur at Richmond, as no truckman would dump one barrel in one car and one in another.

Watchman's Duties.

A competent watchman should be employed to do nothing else but to examine the truck loads in each car and look after the red chalk marks. When he finds a truck load dumped into a car bearing the wrong space number, he examines the destination as marked by shippers, and if he finds the freight in the proper car, the error was made by the receiving clerk. If the space number is correct, but the destination shows the freight in the wrong cars, it shows another error against the receiving clerk. Where the space number is correct in accordance with the destination as marked, and the freight is dumped in the wrong car, then it is the fault of the truckman. Whenever the watchman finds errors of this kind, he has a blank form showing what car found in, how marked with red chalk, how marked by shippers, what car it should have been in, and whose fault it was, sending this report direct to the agent.

All freight going to floor spaces is marked with a cross, followed by the swinging-sign number, so if the watchman finds any freight in a car marked with a cross, he readily understands that is an error of the truckman, if the destination indicates it is a floor station; otherwise it will be chargeable to the receiving clerk. When these errors are reported, truckmen are docked one hour for the first and second offence; third offence, two hours, and for more, a suspension; if it all occurs within the same month, receiving clerks are censured by me personally.

Arrangement of Loading Guides.

In the morning one receiving clerk is designated to make a complete list of all car numbers on a blank used for the purpose, which gives all the space numbers. On the left of the space numbers we show the car number and initial; to the right of the space number we show the destination. This is always the same every day to the principal points.

Each receiving clerk is furnished one of these guides, and all freight he loads direct from the drays into the cars, he puts down the car number and initial on the shipping ticket we retain.

Shipping Tickets.

These tickets are filed by each receiving clerk on an arrow-head file, and are collected every five or ten minutes by a young man, who assorts them out in territorial order in the rate office, local tickets being kept to the last. They are rated, classified and calculated, then sent to the billing office. The fact that a car number is on a ticket indicates to the billing clerk that it is not station order freight. The shipping tickets covering station order freight are handled in the same manner.

Checking Station Order Freight.

When the billing clerk completes his local manifests at night, he puts them on a clip board made especially for this purpose, sends them to the loading clerk, who checks as he loads with an indelible pencil, and enters the car number into which he loads the freight on the way-bill. These way-bills are then returned to the billing clerk, with a memorandum attached, showing where the car breaks bulk, loading clerk's and his packer's initial; billing clerk then copies them. These indelible checks and car numbers show on our book tissues, and are a complete and accurate record of the loading. The way-bills, after being copied, are put in an envelope and sealed, and the point at which the car breaks bulk written on the back. All way-bills accompany the freight, and this arrangement prevents the loss of single way-bills in handling by conductors in assorting their way-bills. We endeavor to so divide the divisions as to get a car containing station order freight to the farthest possible point on a through train before taking up the local.

Advantages of Plan.

1. That the cars are so placed for loading that there is no unnecessary switching. We can therefore hold these cars in the depot to the last possible moment, allowing just sufficient time to pull the cars out and make up the train.

2. It facilitates the handling of foreign empties. Yard people have no questions to ask, but simply place the cars in the space number that is assigned to the junction point through which we received the cars, as indicated by the tag.

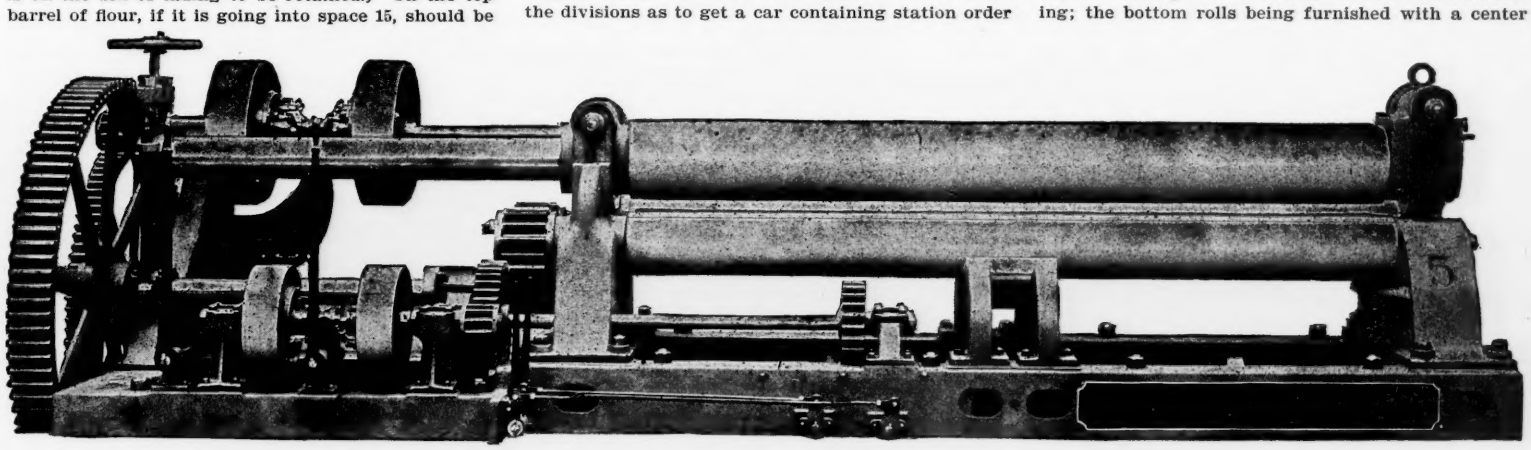
3. There is a great saving in the expense of handling by loading freight direct from the drays to the cars. We keep a man on the yard among the drays to examine their books before they come up to the doors, who notifies them what numbered door to back up to for unloading. We can thus get the bulk of a man's freight directly opposite the car into which we will load it. This means a vast amount of time and expense in a year's work.

4. Mistakes and errors in loading are reduced to a minimum. The mere fact that we can locate the man making an error stimulates each one to avoid as much as possible making one.

5. Instead of being dependent on a truckman, we can in a few minutes educate a green man to handle the freight almost as well as an old hand. We keep a complete list of all the errors made by clerks and truckmen, and at the end of the month prepare a list showing the number made by each individual, all of which tends to stimulate them to increase their efforts to avoid such irregularities.

This system originated and was adopted at Richmond, Va., in 1888, and it has been working satisfactorily for 10 years, and in my judgment it would be economy to provide large stations with the track and depot facilities for inaugurating this loading system. The expense will be small in comparison with the amount saved, in addition to giving much quicker dispatch to the freight and almost a certainty of correct loading.

Mr. Lea informs us that at his freight house, which is 500 ft. long and 60 ft. wide, from 300 to 400 tons of freight are handled daily, the average weight of the goods per package being not over 60 lbs. Goods are received until 5 p. m., and the loading and billing are finished by 6:30 or 7. Although four tracks are available, so that at most of the doors four cars can be loaded at one time, economy of car-room is constantly looked out for and cars go out with an average of eight to nine tons of freight each. The average expense of handling outbound freight is 10.6 cents per ton.



Bending Rolls for the New York Central—From the Hilles & Jones Co.

Hilles & Jones Bending Rolls.

The engraving shows a new set of bending rolls recently shipped by the Hilles & Jones Co. to the New York Central & Hudson River Railroad Co.

The machine is built in various lengths between housings from 8 to 16 ft., and is intended for the ordinary run of boiler work up to ¾-in. thickness of plates. It is an improved design over the same size machine which the company has been building for several years, one of the improvements being that the two ends of the top roll are arranged so that they may be raised or lowered independently of each other through convenient clutches. Another improvement is the increased depth of bed-plate, which is a very rigid and stiff frame, of box section and of continuous surface on the bottom, providing good bearing on the foundation.

The motions of the machine are controlled through two levers; through one of which the bottom rolls are driven by a pair of duplex friction clutch pulleys and a train of gearing. By working the other lever the top roll is raised or lowered through another pair of friction pulleys.

The rolls proper are usually of hammered iron, the top roll having a solid extension for counterbalancing; the bottom rolls being furnished with a center support. The back housing hinges to allow the removal of plates bent to a full circle.

The gearing next the front housing and a number of other parts are of cast steel, and the machine is substantial and convenient in every particular, fully equal to modern requirements. The top roll is 15 in. diameter; the bottom rolls 12 in. diameter. When made 16 ft. between housings the diameter of the top roll is increased to 16 in.

Rules of the Louisiana Railroad Commission.

The newly established railroad commission of the State of Louisiana has issued a long code of rules and regulations for the conduct of proceedings before the commission and for the government of railroads under the new law which established the commission. Some of these rules are wise and salutary, but others appear to have been drawn by a novice. We give the substance of the more important clauses, with some that are notable chiefly as curiosities.

The word "carrier" is to be taken to mean all railroads, vessels, sleeping car companies, express, telephone and telegraph companies. Complaints must be made in duplicate in writing. They may be sent to the secretary of the commission at Baton Rouge at any time. Plaintiffs or defendants may appear before the commission either in person or by counsel. Public sessions will be held at Baton Rouge and also at other places when the public interest requires it.

Each carrier must post in its stations a copy of these regulations, a copy of the commissioners' classifications and tariffs of all rates. Each carrier must show its books to the commission on demand, and must submit to it rate agreements made with other carriers. There shall be no secret reduction of rates, no rebate or other advantage, etc. All rates must be uniform to all. All passenger trains must stop at points where court houses are located.

"All passenger carriers must promptly leave point of origin in accordance with advertised schedule." Trains must not obstruct crossings more than 10 minutes. After Jan. 1, 1900, highway crossings outside of towns or cities must be suitably planked, etc. All carriers must have a general office in Louisiana. Accidents injuring or killing passengers

(*Continued on page 212.*)

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
PUBLISHED EVERY FRIDAY,
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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

In Great Britain the automatic coupler question seems to be entering on a new phase. The latest despatches indicate that the Government is likely to postpone the bill indefinitely, and may withdraw it. This action, according to newspaper correspondence, will be taken because of the pressure brought to bear by the railroad companies and the owners of private cars. The whole matter is a complicated one, but it has never seemed to us judicious to undertake to compel the British railroads to change their style of freight car coupler. The conditions of working there are such that the number of casualties to employees will probably be little affected by the use of an automatic coupler, and the chain and hook coupling now in vogue is very well adapted to the requirements of the service there with the light rolling stock used. If the difference in the matter of casualties to employees is small, then the question of the change of coupler becomes one of utility and efficiency, and the officers of the railroads themselves can decide better than anybody else whether a different method of coupling would facilitate working. It seems likely that an automatic coupler would permit them to handle their cars faster in switching and making up trains. All of these considerations will undoubtedly have attention now that the matter has become one of great immediate interest to British railroad companies. At this moment a number of officers are in the United States looking into the matter. Among these are Mr. Ivatt, Locomotive Superintendent of the Great Northern; Mr. Ellis, Assistant Superintendent of the Line of the Great Eastern; Mr. Mein, Assistant Works Manager of the Great Eastern, and Mr. Constantine, of the Superintendent's Department of the Midland.

General Superintendent Clark of the New York, New Haven and Hartford informs us that the yellow distant-signal lights that were put in use on his road a month ago have thus far proved an unqualified success. About one hundred signals were changed, of which sixty are on the main line between Boston and New London, where numerous fast trains are run. In all, several hundred enginemen have had to make the change, and everything has worked smoothly. Though we mention the success of the yellow first, it is to be borne in mind that the change in the home signals is the most prominent and significant feature of the present action. There are many times as many home signals as distants, and the effect on the minds and the habits of the enginemen is correspondingly greater. The relief of getting rid of white for all-clear is decided, and the runners are emphatic in their expressions of satisfaction. If we were to attempt to draw a moral from this change in lights on the New Haven road, we should base it on the desirability of learning from others' experience. This road (that is, the Old Colony) has had, within a few years, one derailment and one other slight accident in consequence of broken colored glasses, besides the collision which was the immediate incentive to the present change. It might be said, therefore, that, in making a radical change, the company is only doing what necessity compels it to do, and so is not entitled to any particular glory. But the corollary of this is that any one who desires glory—or even ordinary credit—should take action before the fatal collision visits him. The yellow glass finally adopted is about ¼ in. thick, with one surface slightly roughened and with both surfaces smooth in the center.* Yellow glasses have been ordered for all the distant signals on the company's lines, in the Western as well as the Eastern district.

The Resistance of Loaded and Empty Cars.

On another page we give the results of some dynamometer tests, which bring out certain important relations between the resistance of loaded, partially loaded and empty freight cars. The tests are very suggestive, and will no doubt help those who are called on to establish a system of tonnage rating for roads having much level track. For one thing, they show that two trains of approximately equal weights, and made up respectively of loaded and empty cars, may have on grades of one per cent. and over practically the same resistances; on the level where a higher speed must be maintained the empty cars may offer an average resistance fully 50 per cent. greater than the loaded ones. They show also, that on such roads a safe basis for a system of tonnage rating cannot be obtained by simply determining the weights of loaded and empty trains which can be hauled over the principal hills, but that where the speed is high it is even more important to know definitely what the locomotive can do with similar trains on the level.

There are at least two reasons why other portions than the grades should be considered on fairly level roads: One is, as stated, that the resistance of trains running at a given speed on the level varies widely, depending upon how the cars are loaded; the other is that the governing factor of the performance of the locomotive on the grade is not the governing factor of its performance on the level. On grades the tractive weight and the power of the engines proper determine the hauling capacity, while under conditions of running on the level the controlling factor is the capacity of the boiler to furnish steam to the cylinders. As an illustration, the maximum tractive effort of two locomotives might be equal, and their performance on grades be the same, yet if one were lacking in boiler capacity it might be expected to fail to make the required speed on the level with the same trains; or at the same speed it would haul lighter trains than the locomotive with the larger boiler could handle.

This effect of boiler capacity on fairly level roads should, also, be considered before following the rather common practice of determining the rating of one class of locomotives by trial, and then rating those of other classes in proportion to their calculated tractive efforts. Evidently, on level roads, there might be cases where such comparative ratings would be of no value, and it would be necessary to first take account of the relative boiler capacities as the governing factor and consider the available tractive efforts as of secondary importance.

Apart from the specific value of these tests as furnishing information for rating locomotives, the results have a general value as an addition to the available data concerning the resistance of freight trains. In this connection, however, it should be said that because of the varying conditions of temperature and wind, and as no extraordinary precautions were taken to insure great accuracy, we trust no one will feel called upon to make the results the basis for another train resistance formula.

*This glass is the result of a long series of experiments by the railroad company and the glassmakers. All of the yellow or amber glasses found in the market proved unsatisfactory. The lighter shades are open to the objection that at a little distance they give the appearance of an ordinary (white) signal lamp with a dirty glass. The darker ones, at a distance, appear too much like red to suit most railroad men. In trying to secure the happy medium, the first move was to roughen one surface of the glass; and a decided gain was accomplished with glass about ⅛-in. thick, made with deep ridges and furrows. This lens was later made still more satisfactory by making the center perfectly smooth; that is, by taking a disk of the usual diameter, 8¼in., and grinding and polishing a circular surface in the center 2½ in. in diameter. This gave a clear light at a distance, while retaining the irregular surface for the prismatic effect necessary to provide against adverse conditions at shorter distances, due to an unfavorable angle of vision or to fog.

The next experiment was to reduce the roughness. Without any material sacrifice of refracting power, a glass was made with one side about as rough as the surface of a leather glove, and this, on trial, was found to be much superior to that with the furrowed surface. This can be easily kept clean, which might not have proved to be the case with the first product. This glass, like the other, was tried (in signals), both with and without the smooth spot in the center, and, as before, the light was more satisfactory with the small clear surface than without it.

Further experiments, at long and short distances, in dark nights and in bright moonlight, in fair weather and in rain, showed that two thicknesses of this glass gave better results than a single one. This conclusion reached, some lenses of the same glass twice as thick (¼ in.), were next made. These, with the 2½-in. smooth center proved in every way satisfactory; and glasses of this kind have been ordered for all the distant signals throughout the company's lines, both in the Eastern and the Western districts.

The light transmitted through this glass appears to be a mixture of red, yellow and green rays. At a distance of a mile or so, when the rough surface is used, the green rays seem to fail, leaving the light too red; but the introduction of a smooth center gives a light without the objectionable red—that is, a real yellow—which can be seen two miles; while at the same time the retention of the rough surface in the rest of the disk gives all desirable strength for a signal light under any conditions of fog or smoke.

Emergency Single-Track Blocking.

The accident record for January, printed in this issue, presents the worst monthly record of passengers killed since October, 1897, when the Garrisons disaster occurred. Of the 20 passenger fatalities now reported, 16 are chargeable to the butting collision at West Dunellen, N. J., on the 9th. At least three men share the responsibility for this disaster. The operator might have checked the evil results of the dispatcher's negligence, and if he had been watchful he could, no doubt, have checked the lever man's blunder; but whether either of the other two men could have checked the operator's negligence it is impossible to say.

While the lesson of the collision includes a number of features, on some of which there is room for a good deal of discussion, the main points are clear. The first is discipline. The negligence of the operator, Butland, is of such a character as to throw the burden of proof on the company to show that he had had suitable training for his work; and this also is true of the other persons who were negligent. We might with propriety repeat here nearly every word of what we said a few months ago in the case of an incompetent engineman. (Sept. 23, p. 690.) That all this is recognized is suggested by the fact that the coroner or county attorney very soon announced that the company accepted full responsibility for the disaster.

Butland's forgetfulness seems to be of the baldest kind and there is no attempt at palliation of it. The transfer of responsibility to him from the other operator at twelve o'clock, a few minutes before the train started, appears to have been accompanied by no formal record. Mehaffy seems to have been absolutely reckless. With two such men as the principal actors in the tragedy it is impossible to say whether the event in this case would or would not have been any different if the procedure accompanying the transfer of responsibility had been more minutely regulated; and it is perhaps not worth while to discuss the propriety of the arrangement by which an operator goes off duty and yet remains in the office where he can meddle with the work of the one to whom he has transferred a part of his responsibility; but the arrangement is undesirable and may fairly be classed as unnecessary. To forbid it everywhere might sometimes involve a slight additional expense or inconvenience, but we cannot believe that these objections would be of more than temporary importance.

To many, the dispatcher's error will seem less grievous than that of the two operators. He had given orders which, if obeyed, would have moved the trains in safety. He disregarded, no doubt with deliberation, the rule of the code forbidding him to depend upon a holding order alone, to hold a superior train against which he intended to run an inferior; but his apologists will assert, by way of justification, that not all superintendents believe it necessary to invariably enforce this rule of the code. His own superiors will, however, require him to justify himself, not on general principles, but as regards this particular case. Moreover, a court would be likely to hold him to a higher degree of responsibility than it would an operator, because of his higher position and his presumably higher intelligence.

Admitting that the duplicate-order principle may on occasion be suspended, it is important to ask what the occasion depends on. It cannot fairly depend on pressure of work in the dispatcher's office; for in dealing with telegraphic train orders safety is not merely the first consideration; it is practically the only one. The procedure must be made safe or else the trains must be left where they are till doomsday. If the dispatcher cannot attend to such a sudden increase of work as that caused by the blockade of one track on a double-track line, or if the capacity of the train wire is overtaxed, the first remedy availed of generally is to cut out the short section of road affected and put it in charge of a temporary dispatcher. If no competent temporary

dispatcher is available, a pilot engine may be used. No general rule can be laid down as to how great a length of road can be managed with an engine without the use of telegraphic orders, for the amount of time liable to be wasted in getting the engine over the road, as compared with that used for repeating orders and getting signatures may vary greatly, according to local conditions. It depends not only on distance but on the relative experience and expertness of the dispatcher and the pilot man; and also on the frequency and regularity of trains in both directions. If the distance is very short and if the pilot can be advised by telegraph of the movements of trains sufficiently in advance to enable him always to decide promptly whether to go with a train or to wait for a following train, very good service can be accomplished without telegraphic orders.

But if telegraphic orders are to be used and the enforcement of the duplicate principle is to be suspended, common prudence would at least dictate that all other precautions be taken. First of these would be to have the approval, in each case, of two experienced officers who are acquainted with the ground, say the superintendent and the dispatcher, never the dispatcher alone. An equally important question is, Are the operators at both stations well trained in this particular field? Proficiency alone is not enough; experience alone is not enough unless it is either all at that particular station, or is long and varied, say five years. We are not advocating the suspension of the duplicate rule; only suggesting what we deem very obvious precautions to be taken by any one who does suspend it.

The New York reporters who went to West Dunellen very soon discovered that the block system was not in use on that part of the road, and their accounts of the collision included queries why this lack existed. These utterances of the reporters represent public opinion. The demand embodied in them cannot be classed as a very intelligent one, but it deserves attention, and it is encouraging, as showing that the public is gradually learning that the space interval method of running trains is better than the time interval. The answer of most railroad officers probably would be that in such an emergency it could not reasonably be expected that a block system could be set in operation. Even if the system were in use for trains running in the normal direction on each track of a double track railroad there would be no signals available for trains running in the wrong direction; and no one would think of putting in signals for eastbound trains on a westbound track, when they might not be used once a year, and, in many cases probably not for fifty years. We shall not stop to criticise this view, for it has almost universal American railroad practice to justify it; nevertheless there is another view that is worth consideration.

In running trains on a single track without a time table, as has to be done in cases of blockades like that at West Dunellen, a space interval always is maintained for opposing trains, whether we call it by that name or by some other. The dispatcher's orders, addressed to conductors, take the place of the station man's orders, made known by the movement of a signal arm or disk. The Lehigh Valley was working on this plan at West Dunellen, and failed, for reasons already set forth. A space interval being necessary, the question is whether it can be instituted, at unusual places, on a few minutes' notice, in any better way than by dispatchers' orders in the usual form. The employment of the pilot man, already referred to, is one way. This method is in use to some extent. It is a block system of the simplest kind. A friend of the electric staff calls our attention to the fact that that apparatus can be quickly installed for temporary use; and he suggests that a railroad ought to keep on hand a sufficient equipment of staff instruments to be able to thus use them in emergencies. There is merit in this suggestion, and with intelligent, well-disciplined men, there should be no difficulty in carrying it out. An order not to pass a certain station without first getting from the agent a staff, could be issued to all trains as quickly as any other order. With a telegraph wire available, the instruments could be set up in a very short time. The main question, which is one of cost, is whether instruments could be kept, ready for instant use, at sufficiently short intervals along the road to be available in all emergencies. This is important, for an investment of a thousand dollars every 25 or even every 50 miles for emergency apparatus, is not to be made except for very satisfactory reasons. No one need doubt the efficiency of the electric staff, for it is now in use on four roads in this country, and at hundreds of stations in other countries, and it is available for either absolute or permissive blocking.

But suppose the staff be deemed too costly for emergency use, what then? Is the pilot man the only alternative besides duplicate written orders? We think not. We look upon this collision, which emphasizes the need of a space interval plan that can be quickly put in operation, as a strong argument for the use of the space interval in everyday work. It is to be remembered that the essentials of a non-automatic block system, reduced to its lowest terms, are a telegraph or telephone line from station to station, and a red flag or lantern in the hands of the station man. This being so, the desideratum is a station man who can be trusted to work the block system at any time on any track, with any apparatus; and the most practicable way to get such trustworthy men is to have the space interval regularly in force at all stations. A man familiar with the duties of blocking by the usual instrumentalities can be quickly instructed to substitute a flag for his semaphore, and to send trains on the left hand track; and with operators thus trained the dispatcher or other officer controlling the movements of trains can give his orders without having them repeated, thus obviating all needless delay.

It is true that single-track blocking requires a procedure different in details from that required for double-track blocking, but training station men so that they can substitute one method for the other on short notice cannot be a difficult matter. Single track blocking has been put in force in the past ten years, without trouble, at hundreds of stations.

The issuance of "31" orders by the dispatcher is the slowest way of enforcing space intervals by telegraph for opposing trains on a single track, and the electric staff or its equivalent affords the quickest method. The plan under which the station operators move the trains unaided by the dispatcher requires little if any more time than the staff. It is, equally with the staff, a great relief to the dispatcher. (In saying that the operators act without the aid of the dispatcher we mean, of course, without aid as far as safety is concerned; they must always have the advice of the dispatcher or of the superintendent as to giving preference to one train or another when two desire to use the track at the same time.) The question is, whether or not one or the other of these time-saving methods cannot be safely substituted for the usual dispatcher's orders. All experience with moving trains by means of words conveyed over an electric wire—whether we call the process dispatching or block-signaling, or what—goes to show that a substantial saving of time can be made, and safety at the same time enhanced. Whichever method is adopted, the essence of the problem is that part of it dealing with the organization of the personnel.

January Accidents.

Our record of train accidents in January, given in this number, includes 96 collisions, 94 derailments and 7 other accidents, a total of 197 accidents, in which 63 persons were killed and 176 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

COLLISIONS.	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	7	0	0	7
Misplaced switch	2	0	1	3
Failure to give or observe signal	5	0	6	11
Mistake in giving or understanding orders	0	6	0	6
Miscellaneous	9	6	8	23
Unexplained	21	11	14	46
Total	44	23	29	96

DERAILMENTS.			
Broken rail	4	Open draw	1
Loose or spread rail	3	Runaway train	1
Defective bridge	3	Animals on track	2
Broken wheel	5	Landslide	6
Broken axle	6	Snowslide	1
Broken truck	3	Washout	3
Fallen brakebeam	1	Malicious obstruction	2
Failure of drawbar	1	Accidental obstruction	2
Broken car	1	Unexplained	47
Bad loading	1		94
Bad switching	1		

OTHER ACCIDENTS.	
Boiler explosion	1
Broken side rod	3
Cars burned while running	1
Various breakages of rolling stock	2
	7
Total number of accidents	197

A general classification shows:

	Collisions.	Derailments.	Other accid's.	Total.	P. c.
Defects of road	0	10	0	10	5
Defects of equipment	7	17	6	30	15
Negligence in operating	43	4	0	47	24
Unforeseen obstructions	0	16	0	16	8
Unexplained	46	47	1	94	48
Total	96	94	7	197	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Passenger	34	17	4	55
Freight and other	147	77	3	227
Total	181	94	7	282

The casualties may be divided as follows:

Killed:	Collisions.	Derailments.	Other accid's.	Total.
Employees	24	13	3	40
Passengers	18	2	0	20
Others	2	1	0	3
Total	44	16	3	63
Injured:				
Employees	47	31	2	80
Passengers	31	50	12	93
Others	0	0	3	3
Total	78	81	17	176

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road	0	15	1	6
Defects of equipment	0	0	5	5
Negligence in operating	18	31	25	48
Unforeseen obstructions and maliciousness	0	13	4	5
Unexplained	2	34	5	16
Total	20	93	40	80

Thirty-one accidents caused the death of one or more persons each, and 38 caused injury but not death, leaving 128 (65 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with January of the previous five years shows:

	1899.	1898.	1897.	1896.	1895.	1894.
Collisions	96	113	51	50	55	41
Derailments	94	130	68	78	67	69
Other accidents	7	14	7	5	7	6
Total accidents	197	257	126	133	129	116
Employees killed	40	39	26	40	23	16
Others killed	23	9	7	7	9	28
Employees injured	80	105	58	68	54	49
Others injured	96	75	42	51	46	80
Passenger trains involved	55	71	55	45	45	51
Average per day:						
Accidents	6.35	8.29	4.06	4.29	4.16	3.74
Killed	2.03	1.55	1.06	1.52	1.03	1.42
Injured	5.68	5.80	3.23	3.84	3.93	4.16
Average per accident:						
Killed	0.32	0.18	0.26	0.35	0.24	0.37
Injured	0.84	0.70	0.79	0.89	0.76	1.11

There were three bad butting collisions in January. The worst one, that at West Dunellen, N. J., is discussed under another head. At Sunol, Neb., passengers were killed in a wreck which was accompanied by fire, some of the victims being burned. At Elk Valley, Tenn., a disastrous collision was caused by a mistake in reading the time-table, the same mistake being made, it is said, by both the conductor and the engineman. This is a kind of error which many will look upon as preventable only by the establishment of the block system.

Two serious derailments of passengers trains, those at Olney, Ill., and at Great Bend, Pa., turned out very fortunately. Two freight train accidents are attributed to the fact that the engineman had fallen asleep. The engineman and two other men on the engine of a freight train were asphyxiated by gas in a tunnel near Tamaqua, Pa., on the 18th, but the incapacity of the engineman resulted in the slackening of the speed of the train and brakemen came to the rescue of the unconscious men in time to resuscitate them.

We have accounts of 11 electric car accidents in the United States in January, in which 11 persons were injured. In one of these cases a car ran into an open draw. At Tacoma there was a runaway of an electric car (or train) carrying freight, the brake power evidently being insufficient or badly managed. In two cases cars were struck by locomotives on railroad crossings, one of them being due to the failure of the power and the other to the derailment of the street car on the crossing. In the last-named case the passengers had time to get out of the car.

Annual Reports.

Texas & Pacific.—The report for the year ending Dec. 1 records the operations of a year of exceptional prosperity in the Southwest with abundant crops and activity stimulated in all industries. The gross and net income of the company were above any previous figures. There was a balance of about $920,000 above all fixed charges, rentals, etc. Various charges for improvements, of which $720,000 was for equipment, absorbed nearly all this balance, so that the surplus reported is only $31,000, as is seen in the following summarized statement of the income account:

	1898.	1897.	Inc.
Gross earnings	$8,006,504	$7,588,649	$417,855
Operating expenses	5,859,725	5,622,748	236,977
Net earnings	$2,146,779	$1,965,900	$180,879
Total net income	2,304,558	2,116,197	188,361
Bonded interest	1,285,278	1,279,490	5,788
Rentals, etc	98,808	130,845	*32,037
Balance	$920,470	$705,862	$214,610
Equipment, etc	771,821	257,893	513,928
Westwego fire suit	117,500	.....	117,500
Balance	$31,151	$447,969	*$416,818

*Decrease.

More than two-thirds of the increase was from the better passenger revenue, but this disproportionate improvement was largely due to the fact that in 1897 passenger travel failed to respond to the better business conditions, partly because of the yellow fever quarantine, and the year closed with a loss of

$70,000, while freight revenue gained $838,000. In 1898 passenger business added $305,000 to the income and freight only $83,400. The gain in the latter was from a small improvement in the ton-mile rate. This was 1.13 cents in 1898, against 1.04 cents in the previous year.

The traffic operations present some unusual results in the statistics of freight movement. There was a small decrease in tons carried (6,800), and a decrease of 6 millions (6½ per cent.) in the ton-miles. This was attributable to a falling off in the through business, which was affected throughout the year by sharp competition, which had influence in other directions, particularly in decreasing the train load, lighter trains being required to meet the faster schedules for freight trains. While competitive traffic thus fell off, local tonnage gained somewhat, but not enough to offset the losses in through business. The changes in traffic statistics during the past year are shown below:

	1898.	1897.	Inc.-Dec.	
Local frt. rev.	$2,294,144	$2,349,078	Dec.	$54,934
Through frt. rev.	3,474,459	3,336,092	Inc.	138,367
Local tonnage	968,672	881,081	Inc.	87,591
Through tonnage	1,391,200	1,485,608	Dec.	94,408
Local ton-miles	152,849,000	151,440,000	Inc.	1,409,000
Through ton-miles	359,156,000	396,884,000	Dec.	37,728,000
Passengers carried	1,025,200	865,400	Inc.	159,800
Passenger miles	43,434,000	34,245,000	Inc.	9,189,000
Av. freight haul (miles)	217	232	Dec.	15
Av. carload (tons)	10.8	11.4	Dec.	.6
Av. train load (tons)	151.8	165.2	Dec.	13.4
Av. no. loaded frt. cars per train	14.0	14.5	Dec.	.5
Ton-mile rate	1.13	1.04	Inc.	.09
Net ton-mile rate	.31	.29	Inc.	.02
Frt. train miles	3,372,700	3,319,900	Inc.	52,800

Expenses absorbed $237,000 of the increase in gross or more than half. In 1897, also, the largest part of the gain in gross was absorbed in operating expenses. In the last two years, gross receipts have gained $1,181,000, but net only $686,000. A considerable part of the growth in expense account has been in the maintenance items. The expenses of maintenance of way in 1898 were $821 per mile, against $806 per mile in 1897, and $907 per mile in 1896.

The improvement work charged to expenses last year included 26½ miles of new side track; 78 miles of ballasting, 180 miles of new fencing, and 5,280 tons of 75-lb. rails were purchased at a cost of $100,269. For all such work the company has had to rely on current earnings, no capital account being available to provide funds for betterments. The surplus, therefore, has been used up each year in improvements or additions to equipment. The average charge for betterments in the last seven years has been over $255,000 a year.

The Chairman of the Midland Railway of England, Sir Ernest Paget, at the half-yearly meeting held last month, told the stockholders that the directors expected it would be necessary to curtail the train service between London and suburban stations where the street railroads are taking away some of the Midland's passenger traffic. And not only this; the directors "devoutly hope that these new competitors will succeed;" that is, that they will relieve the Midland of still more of its suburban passenger traffic. The meaning of this is, of course, that the cost of the ground necessary for enlarging passenger terminals in London, or for widening the right of way leading to such terminals, is so great that if the additional business secured by the enlargement is to consist of passengers who pay the company only a few pence each, the undertaking is likely to result in a loss rather than a profit. Continuing, the Chairman said: "It is quite right to persuade the working classes of London and of our great cities to live in better social relations in suburban districts, but the great difficulties of providing transport for them to and from their work at the exceedingly low fares which their means demand has not been so fully recognized. Now we have been spending, and are spending, very large sums of money in the neighborhood of London in doubling our line and in providing works and facilities in order to better the present state of affairs. But if I said that this expenditure was going to set matters right I should be saying a great deal more than I can really feel, because it is not only the running lines that we want, it is the terminal accommodation also. St. Pancras, large as it is, cannot now accommodate any, or certainly very little, more traffic at the busiest time of day. How to enlarge St. Pancras is, indeed, a problem. No doubt we might cross the Euston road and purchase land on the other side of the Euston road, and make a station there; but just imagine the cost of such a thing. I do not see how we can provide terminal accommodation in London with any prospect of getting fair remuneration for the capital which we should have to lay out."

The Railway and Canal Commission of Great Britain has made its tenth annual report, which is simply a record of the cases considered by the Commission during the year. The list contains a total of 103 cases, of which 26 were settled out of court. The cases presented near the end of the year and which are not yet settled, are mostly demands for more frequent workmen's trains to and from London, or for lower rates on such trains. There are no less than 13 cases of this kind, and the complaints have to do with eight or ten different roads. Chief among the complaints in the freight department are disputes regarding the terminal charges to be made by railroads for taking freight from and to private side tracks. Herapath's Journal says that among the cases pending at the end of the year none can be called big.

Rules of the Louisiana Railroad Commission.

(*Continued from page 209*)

or employees must be reported by telegraph. Consignees must be notified of the arrival of freight.

Each passenger may carry 150 lbs. of baggage. The next seven clauses are designed to require satisfactory connections of passenger trains and the collection of only ticket fare on a train when a passenger has been unable to buy a ticket. Where passengers fail for want of proper diligence to supply themselves with tickets, one cent a mile additional may be charged, though not more than 50 cents. No rate shall be changed without leave from the commission, but excursion commutation and mileage rates may be made if no unjust discrimination is practiced. Depot ticket offices must keep all forms of tickets that are sold at the city ticket offices in the same city. All connecting carriers must make close connection [of trains] whenever practicable. Delayed trains must be bulletined and notices on the board must be erased immediately after the departure of trains. After Jan. 1, 1900, separate waiting rooms for white and colored passengers must be provided. This clause goes into details, such, for instance, as requiring "a substantial cooler" in each waiting room, supplied with good and wholesome water. Baggage must be carefully handled, and at small stations train hands must assist the baggage master. All coaches in regular passenger trains must have the usual bell cord and a safety cord; but what the safety cord shall be attached to seems to be left undecided.

Sleeping car companies must have the doors of their cars open at every stopping place, and the porter must have a step ready for the convenience of passengers.

When there is a break in the road passengers must be warned before they get aboard a train of the probable delay. All passenger carriers must provide an adequate supply of good and wholesome ice water. Separate compartments (in cars) must be provided for the accommodation of white and colored passengers.

Any unused portion of any ticket must be redeemed by the carrier at any of its ticket offices. No form of ticket now in use shall be withdrawn without the consent of the commission.

Freight.—All roads under one control will be treated as a single carrier. Joint rates must not exceed the sum of the locals. A through rate equal to the sum of the locals must afford to each carrier its local rate, provided the initial carrier delivers the freight at the first junction. In making mileage tariffs the commission will consider no zone smaller than five miles, and above 100 miles 10-mile zones will be used as bases, subject, however, to exceptions. Below 20 miles and above 250 miles rates may be reduced without changing rates for intermediate distances; but a company reducing rates for 250 miles or over must make the same reduction for similar distances on all of its roads, and in no case shall it charge more for a short than for a long distance. Between competitive points the longer line may reduce its rate to the level of that made by the shorter, but only on approval by the commission. No freight rates now in existence shall be changed without the consent of the commission, except that, to conform to the constitutional long and short haul clause, the shorter distance may be reduced.

No carrier shall permit a blockade of any class of freight on account of a dispute with a connection. All carriers must issue duplicate freight receipts and give through rates if practicable. Claims for overcharge, loss or damage must be settled within 30 days. The delivering road must settle all claims. Freight houses must be opened from 7 to 12 and 1 to 6.

The location of freight or passenger stations must not be changed without leave. Switches [sidetracks], spurs and depots must be located as required by the commission.

Telegraph companies must not charge more than 25 cents for a message (10 words). Higher rates are, however, expressely allowed for on the lines of two local telegraph companies. No telegraph office shall be discontinued without leave.

No telephone company shall charge more than 25 cents for a message of 10 words or less, and in general telephone companies are subject to the same rules as telegraph companies. They must not increase the rental of instruments without leave.

New Power Plant of the Consolidated Traction Co., Pittsburgh.

Until recently, the lines of the Consolidated Traction Company, of Pittsburgh, took power from seven stations, situated in different parts of the city and supplying power to both the cable and the electric roads. In building one central plant to do the work of these seven, it was necessary to exercise considerable engineering skill, and the credit for the successful working of the new plant is largely due to the Chief Engineer and General Manager of the road, Mr. G. F. Greenwood. From Mr. Greenwood's recent address before the Engineers' Society of Western Pennsylvania we have prepared the following brief account, giving the more important features of the installation:

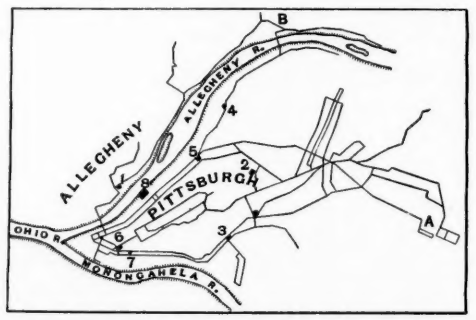
When the cable and electric lines in Pittsburgh, Pa., consolidated, the new company came in possession of seven power houses, situated as shown in the accompanying outline map, but none of these stations had easy access to a good water supply and were some distance from the coaling stations. The site chosen for the new station is at Twentieth street, between Railroad street and the Allegheny River. Coal may be obtained either from the Baltimore & Ohio, the Pennsylvania lines, or from barges, while an abundant supply of water is easily accessible.

It was necessary to concentrate the plant within as small a floor space as possible, in order to allow for extensions. The total power required, calculated from previously obtained data, was found to be about 600 k. w., which was divided equally among six sets of machines.

The new station is larger than the combined capacity of the old stations, yet runs for half the daily working cost. It may be well to note that the value of the real estate of the old plants is sufficient to cover the cost of the new station. The new plant will use about 100 tons of coal a day, thus requiring large storage capacity.

In selecting boilers return tubular could not be considered, owing to the large space they occupy. Sectional water-tube boilers were chosen in preference to internally fired boilers of the marine type, because they are cheaper, equally efficient and better adapted for the exacting requirements of street railroad work.

Each battery of two boilers is provided with a separate iron smokestack, thus saving space and being cheaper than flues connecting with a single large stack. Low-speed compound condensing engines were chosen, being found on calculation to be the



1. *Allegheny Electric Station.* 5. *34th St Cable Station.*
2. *Ben Venue " "* 6. *Wylie Ave. Cable Station.*
3 *Oakland Cable Station.* 7. *Washington St. " "*
4 *47th St. Electric.* 8. *The New Electric "*
A. Wilkinsburg Borough. *B. Sharpsburg Borough.*

Power Plants of the Consolidated Traction Co., Pittsburgh.

most economical under the conditions that had to be met. Emery's comparative figures for the cost of steam power generated by different types of engines were used in deciding what class of engines was best suited for the work. Taking coal at $1 a ton and engine consumption at 18 lbs. of water per horse-power, his figures for railroad work, based on 20 hours a day, 365 days in the year, where the machinery to be installed is 50 per cent. in excess of average, were as follows: Simple low-speed condensing, $37.64; compound, high-speed condensing, $37.51; compound, low-speed condensing, $36.54. These figures agree very well with the estimate of one-half of 1 cent for the cost per horse-power delivered from the station, which was taken as a basis of the calculation of the feeder system for the Pittsburgh plant.

A direct-connected air pump was chosen, mainly because separately driven pumps would have been more expensive, due to the extra cost of additional steam cylinders and valve gears. A direct-connected pump is easier to work and requires practically no attention during operation, the main disadvantage being that the engine must be run non-condensing in case of a break-down of its own feed pump.

Coming now to the electrical features of the plant, it should be said there were two systems to choose from, the almost universal 500-volt direct current and the polyphase alternating current transmission at high voltages, transmitted to sub-stations, where transformers and rotary converters would deliver a 500-volt direct-current to the cars.

The principal objection to using the converters in this installation was due to the costly machinery which would be required in the sub-stations in order to take care of the average maximum load which would come on its feeders during the widely fluctuating demands of the street railroad, while most of the time the machinery would be running underloaded. The 500-volt system was continued in use,

but only after a careful consideration of the merits of other methods of distribution.

Another feature of interest is the use of storage batteries as regulators at different points in the system. There are three of these batteries now in use, connected directly on to the line. When the load is above the average the batteries discharge and relieve the power house, and are charged again when the load falls below average, thus keeping load and potential on power station more constant. During the busiest hours the batteries discharge continually, charging again between midnight and 5 A. M. to compensate for this drain.

TECHNICAL.

Manufacturing and Business.

The Hocking Valley Ry. has ordered from the Brown Hoisting & Conveying Machine Co., Cleveland, O., two ore-handling machines for loading vessels at the docks at Toledo. These machines will have a capacity for unloading from 1,500 to 1,600 tons of ore in 10 hours.

A 24-hour test of the new pumping engine at the Fourteenth St. Station, Chicago, was made for the city, and the builders March 17-18, by R. W. Hunt & Co., of Chicago; Newcomb Carlton, of Buffalo, and W. C. Cappelen, of Minneapolis. The engine was built and installed by the Lake Erie Engineering Works, of Buffalo, at a cost to the city of $85,000, and should have a capacity of 30,000,000 gals. of water a day.

Mr. C. S. Knight has been appointed Vice-President and General Manager of the Siemens & Halske Company of America, and has taken up his new work with headquarters at the general offices of the company, Monadnock Building, Chicago. Mr. Knight has been connected with the Fort Wayne Electric Co. and the Fort Wayne Electrical Corporation since about 1886, and is well known to electrical and street railroad men, among whom he has a wide acquaintance.

The National Pneumatic Tool Co., Philadelphia, Pa., has acquired the business of the C. H. Haeseler Co., of that city. The new company is incorporated for $200,000, all of which is paid in. The company is installing machinery to double the capacity of the plant. C. H. Haeseler is General Manager of the company and Glenn B. Harris Secretary.

At the annual meeting of the stockholders of the St. Louis Car Wheel Co., held March 14 the following were elected directors: J. H. Bass, President; John W. Nute, Secretary and Manager; F. S. Lightfoot, Treasurer; A. A. Hilton and J. J. Morse.

The works of the Charles Scott Spring Co., of Philadelphia, were completely destroyed by fire March 13. The company has already made preparations to rebuild, and will fit up temporarily to take care of orders now on the books, as well as new business. There will be practically no delay in filling orders.

E. W. Bliss & Co. has declared a quarterly dividend on the common stock of 2½ per cent., and on the preferred stock of 2 per cent., payable April 1.

The Westinghouse Air Brake Co. has declared a regular dividend of 2½ per cent. and an extra dividend of 2½ per cent., payable April 10.

The Otis Elevator Co. has declared a quarterly dividend on its preferred stock of $1.50, payable April 15.

H. E. Keeler has resigned as Eastern Agent for the Adams & Westlake Co. Mr. Keeler was connected with the Adams & Westlake Co. for a number of years, during the last five of which he was the Eastern Agent, with headquarters in New York City.

Charles Moulton Mitchell, President of the Bridgeport Brass Co., Bridgeport, Conn., and of the Steele & Johnson Mfg. Co., Waterbury, Conn., died March 9, at his home, in Waterbury, at the age of seventy-seven.

The Link Belt Machinery Co., Chicago, has increased its capital stock from $250,000 to $375,000.

The Cincinnati Planer Co., of Cincinnati, O., has been incorporated with a capital of $30,000, to make iron and brass working machinery. The incorporators are: W. H. Burtner, R. A. Holden, Jr., W. H. Burtner, Jr., George A. Armstrong, Jr., and others, all of Cincinnati.

Iron and Steel.

A lot of 500 tons of rails for Glasgow, Scotland, for the Caledonian RR., is now ready for shipment at Sparrow's Point. This is said to be the first shipment of rails ever made from this country to Scotland. Rails are also being loaded at Sparrow's Point for Melbourne, Australia.

The Lukens Iron & Steel Co., of Coatesville, Pa., has awarded contracts for extensive improvements to its plants.

According to the Journal of Commerce, the New South Wales Government has placed the order for 10,000 tons of rails with Cammell & Co., of London at £4 5s. 3d. a ton. The lowest American bid was 8s. 3d. a ton lower, but when the freight was added it was found that the English company was in a position to deliver at 11s. 3d. below the American competitor.

Notice has been issued to the 3,000 employees of the Pencoyd Iron Works at West Manayunk that an advance and readjustment of wages will be made in all departments of the plant on March 27.

According to press despatches the Riter-Conley Co. has received the contract for building a power house for the Bristol Tramway & Carriage Co., of Bristol, England.

The American Steel & Wire Co. has declared a dividend on its preferred stock of 1¾ per cent., payable April 15.

The Federal Steel Co. has declared a dividend on its preferred stock of 1½ per cent., payable April 5.

The American Tin Plate Co. has declared a quarterly dividend on its preferred stock of 1¾ per cent., payable April 29.

At the annual meeting of the stockholders of the Tennessee Coal, Iron & Railroad Co., held March 15, the following directors were elected: James T. Woodward, W. S. Grunee, Jr., E. R. Chapman, Oliver Payne, J. G. Moore, C. M. McGhee, A. D. Broadman, B. F. Tracy, Cord Meyer, David J. McCombs, A. T. Smythe, William Barbour, James Henry Smith, N. Baxter, A. M. Shook and James Bowron.

The annual meeting of the Pennsylvania Steel Co. was held March 14. The President's report for the year ending Dec. 31, 1898, shows that the Steelton plant made a net profit of $313,912, while the Sparrow's Point plant made a net loss of $262,893, leaving a net gain of $51,009. The following Board of Directors was elected: Edgar C. Felton, Luther S. Bent, Effingham B. Morris, S. W. Hunnewell, John Cassels, George Wood, C. Stuart Patterson, Evans R. Dick and William B. Winsor. At a meeting of the Directors Mr. H. F. Martin, Assistant to the President, was appointed General Sales Agent of the Pennsylvania Steel Co. and the Maryland Steel Co. Frank Tenney, Assistant General Superintendent, succeeds Mr. Martin, and John W. Daugherty, Superintendent of Glass Furnaces, succeeds Mr. Tenney.

New Stations and Shops.

Work has been begun on new suburban stations on the Milwaukee division of the Chicago & Northwestern at Highland Park and Lake Forest. At Highland Park there will be two stations, one on each side of the track, the larger being 122 ft. by 26 ft. The buildings will be of brick, with slate roofs, and there will be sheds over 200 ft. long. The cost will be $16,000. Plans for these improvements were prepared by Frost & Granger, Architects, Chicago.

The Texas & Pacific is building new shops and a roundhouse at Ft. Worth, Tex., The machinery for use therein will be transferred from the present shops.

Press despatches have recently stated that the Illinois Central would build freight terminals and warehouses in Omaha. We are officially informed that the company has no intention of doing this at present.

Newspapers have recently contained items to the effect that plans are being prepared for a new Union station to be built at Monterey, Mexico. We are advised by an official of the Mexican International as follows: "I beg to say that no arrangement has been made by this company in regard to the construction of a Union depot at Monterey, Mexico."

The Chicago, Burlington & Quincy is preparing plans for a new freight house at Kansas City. The general dimensions will be 60 ft. by 600 ft., about 80 ft. to be two stories high. It will be built of brick, and the probable cost, including track work in connection therewith, will be $100,000.

Articles of incorporation have been filed for the Union Station Railway Co., of Buffalo. The capital stock is $60,000. Newspapers state that plans for a new depot are now being prepared by Shepley, Rutan & Coolidge, of Boston.

The Pittsburgh Steel Casting Co. has been organized with a capital of $75,000. A plant will be built, and it is expected that it will be in operation by July 1. The stockholders are Charles D. Marshall, Uriah Tinker, C. C. Smith and Howard Fisher. Mr. Smith has been connected with the Reliance Steel Casting Co., and Mr. Fisher has been with the McConway & Torley Co.

Pneumatic Interlocking.

The Standard Railroad Signal Co. is to put in an interlocking switch and signal plant at Jamaica, N. Y., for the Long Island Railroad, the apparatus to be worked by low pressure compressed air. This plant will be similar to that in the passenger station yard of the New York Central at Buffalo, N. Y., which was described in the Railroad Gazette of July 8, 1898, page 488. The Pneumatic Railway Signal Co., which built the Buffalo signals, is now controlled by the Standard.

American Locomotives in England.

Consul Smyth writes from Hull, Feb. 18, 1899: "A few months ago the announcement was made that the Midland Railway Company had closed a large contract for new locomotives with American builders. This news naturally created a great deal of controversy, especially in railroad circles. The extract below is taken from a review of the chairman's speech at the annual meeting of the company, and appears in all the metropolitan dailies and leading provincial journals this morning. It is regarded as a striking example of what can be accomplished through the resources of American manufacturers, as well as by the progressive and energetic spirit that brings them into action."

It would be seen that the directors had ordered some locomotives in America, and, as this was a new departure, no doubt some information on the subject would be of interest. He would much prefer to order goods of any kind that were of home manufacture, and he might say that the question of cost was not one that entered into the calculations of the directors when asking for tenders from over the water. The increase in their train mileage had been very large lately, being in 1898 considerably over 2,000,000 miles; and it was obvious, therefore, that additional engines must be purchased. For years past, their locomotive superintendent (Mr. Johnson) had impressed upon them that they worked their engines too hard. He believed the ideal position, according to Mr. Johnson, would be that they should have 75 per cent. in steam; but 90 per cent. had been much nearer their figure, so that there was no margin. They had now on order in this country 170 engines. They commenced ordering in December, 1897, and the first delivery should have been made in July, 1898, and they should have been receiving a number in each month, which would have made up a delivery to the present time of 48 engines. The company had not received one of these. The last order given was in November of last year for 20 engines at an extravagant price, and the makers did not even promise delivery of one for fifteen months, the order to be completed in May, 1900. Locomotives were a necessity to the company; they must have them, and so the directors determined to ask for tenders from America. They asked for tenders for ten engines each from two firms—the Baldwins and Schenectadys—and they received offers to deliver in the one case within ten weeks from the date of the receipt of all necessary information for construction, and in the other case shipment from America was promised for March next. This offer was made in December, so that, while the directors could not get an engine made in England and delivered in Derby in less than a year and a quarter, they could get 20 from America in four months. The engines would be of the American type, with certain alterations, which Mr. Johnson considered desirable. They would be of the same power as the Midland engines, and it would certainly be interesting to watch their performance, as Mr. Johnson—and he hoped all his staff—intended that they should have fair play in every particular.

Rhode Island Locomotive Works.

On March 14 the plant of the Rhode Island Locomotive Works, at Providence, R. I., was transferred to the International Power Co., recently incorporated under the laws of New Jersey, with a capital stock of $8,000,000. The terms of the sale have not been made public. Last August an option on the plant was secured by Joseph H. Hoadley, of New York; Joseph Leiter, of Chicago, and others. The International Air Power Co. was afterwards formed, and the name has now been changed to the International Power Co. The company has just received an order to build 22 locomotives. Plans are also being made to enlarge the plant and install new machinery, when the matter of making compressed air appliances will be taken up. The officers of the company are: President, Joseph H. Hoadley, New York; First Vice-President and Treasurer, Geo. W. Hoadley, New York; Second Vice-President and Manager of Manufacturing Department, Joseph Lythgoe, and Secretary, Assistant Treasurer and Purchasing Agent, Geo. H. Wilson.

Quick Work by a Signal Company.

On the morning of Jan. 21 the switch and signal cabin of the New York, New Haven & Hartford at Westport, Conn., was partly destroyed by a freight car which ran off the track, and the interlocking machine was disabled. On the next day an order for a new 40-lever machine was given to the Union Switch & Signal Co., and this order reached the factory at Easton, Pa., 76 miles west of New York, on the morning of the 23d. The machine was shipped from there on the evening of the 24th, was on the ground the next day, and on Jan. 28 it was in position for operation. A new cabin was built, and the whole plant was restored complete on Feb. 5. It is believed that this is the "record" for making and delivering a complete interlocking machine.

THE SCRAP HEAP.

Notes.

The Chicago, Rock Island & Pacific on March 10 issued a notice that after that date the wages of all employes in the Roadway Department would be increased, the advance varying from 5 to 10 per cent. This practically restores wages to what they were previous to the reduction made during the dull times, and affects more than 3,000 men.

The South Pacific has issued orders to have all the apostrophes and possessive s's dropped from the titles of stations that are named after individuals. This is done for the sake of uniformity, brevity and preservation of the names originally intended.

In the suit brought by the Illinois Manufacturers' Association against the United States Express Co. to determine who should pay the stamp tax on shippers' receipts, the Appellate Court at Chicago last week decided unanimously in favor of the shipper, and that, under the law, the express company was obliged to furnish a stamped receipt to the shipper, on the ground that the tax was intended to be upon

the carrier and not the shipper. This decision sustains the judgment of the lower court, but the case will now be carried to the Supreme Court. If all the suits concerning the question that have been decided by local courts shall be appealed, the Supreme Court will have a good variety of opinions to select from. The Commissioner of Internal Revenue has issued a decision on the question whether money orders issued by express companies are to be classed as "exchange," and so necessitating the payment of a yearly tax of $50 by every office issuing such orders. He decides that the tax need not be paid.

A number of newspapers have lately made the announcement that the Interstate Commerce Commission has under consideration a proposed Federal law to require all railroads to introduce the block system by Jan. 1, 1902. The newspaper accounts appear to have been furnished by a man named P. L. Koscialowski, who has sent to the Commission a long memorial on the subject.

The Wells Fargo Express Co. has concluded a contract to do the express business of the Colorado Southern Railway from May 1, 1899. The express business on this road (formerly the Union Pacific, Denver & Gulf) is now done by the Pacific Express Co.

The local Sunday passenger trains on the Delaware, Lackawanna & Western, the service of which was begun last Sunday, proved quite popular, the trains averaging about 200 passengers each throughout the day. There were eight local trains out of the New York terminus (Hoboken) over the Morris & Essex Division and the same number eastbound. One of these trains runs through to Washington, 67 miles, and three others go as far as Dover. There is one new local train each way between New York and Phillipsburgh over the Boonton branch. On the Newark & Bloomfield branch there are seven trains each way, and on the Passaic & Delaware two each way. The Clergymen's Union of Hoboken has started a remonstrance against running trains on Sunday and papers are being circulated for signatures.

New York Canals.

Superintendent Partridge of the New York Department of Public Works says that he proposes to open the canals as early as April 17 if climatic conditions permit.

Infringement on Frieze Plush Patents.

The Sanford Mills, Sanford, Me., have brought suit against the Massachusetts Mohair Plush Co. for infringement of patents owned by the Sanford Mills relative to the manufacture of frieze mohair plush, which is extensively used on the railroads in this country and abroad.

Additional Trains on Manhattan Elevated.

The Manhattan Elevated Railway (New York City) announces that, beginning April 1, the trains of the Ninth avenue line will be kept running all night. At present the stations on this line, south of 59th street, are closed at 8.30 p. m., and the service is not resumed until morning. Under the new time table trains will run at eight-minute intervals until midnight, and then every 15 minutes until morning. This is the same arrangement as that now in force on the Sixth avenue line. All of the trains above 59th street will continue to run over the Sixth avenue line south of that point, the same as now. The company also announces four new express trains southward on the Sixth avenue line in the middle of the forenoon. These trains will run from 116th street to 42d street without stopping.

Politeness as an Asset.

General Manager Underwood of the Baltimore & Ohio Railroad, has issued the following general notice to station agents and trainmen:

"Your special attention is directed to the treatment of patrons by employees of the company. Complaints have been made from various sources of discourtesy to freight and passenger patrons on the part of our agents, or their representatives, at several of our stations, and also inattention of conductors and brakemen to properly care for the comfort of passengers. There should be no cause for such complaints. It is a part of your duty to see that our patrons are treated at all times with politeness and courtesy, not only by yourself, but by employees under your charge. One of the valuable assets of a railroad company is uniform politeness and courtesy from all of its employees to its patrons, and this capital must not be encroached upon. It is proper for you to understand that advancement does not depend wholly on your efficiency, and will be measured in a great degree by the treatment accorded to patrons."

Snow Blockades.

The Wyoming line of the Colorado & Southern, the railroad northward from Cheyenne, formerly known as the Cheyenne & Northern, was opened on March 17, after being blocked by snow for nearly a month. A passenger train on which were about 40 passengers, was laid up near Iron Mountain, Wyo., for about three weeks. Communication was maintained with the outer world by telegraph during the whole of this time, but attempts to run snowplows through from Cheyenne, though repeatedly made, were given up one after another, and the people on the train, among whom was the Superintendent of the division, had considerable difficulty in getting food and fuel, though they were finally relieved by the contributions of farmers and ranchmen for 20 miles around. Some of the passengers came out on snowshoes before the road was opened. These and nearly all the rest, showed evidence of considerable suffering. It appears that the company was dependent upon rotary snowplows borrowed from the Union Pacific, and that the work of clearing the track had to be intermitted once or twice because the plows had to be withdrawn to assist in keeping open the main line of the Union Pacific.

On the Leadville line of the Colorado & Southern the first train from Denver since Feb. 21, consisting of a rotary plow and four engines, reached Como on March 16. The train was a week in running from Grant to Como, 23 miles. It was expected that it would take ten days more to reach Breckenridge, and several weeks to get to Leadville.

A Dog Fight—In Three Acts.

Are your crossing-gates dog-tight? Because if they are not, and your railroad is in Prussia, you may have to pay smart-money. In the Summer of 1897, as the gates were closed at a railroad crossing in Munster, a hunting dog dashed under, over or through them, struck the track simultaneously with an express train, and came out sausage meat behind it. The dog's owner wanted $50 damages—it was a dog with a pedigree—but the railroad management said no. They had done their duty by closing the gates, and it was the owner's business to keep his old dog off the tracks. Then the owner sued. The court said that under the general road police regulations, it was the duty of the owner of the railroad, not the owner of the dog, to keep the animal off the track at crossings, and it appointed experts to report whether the railroad had provided a reasonably effective barrier. The experts said no. The railroad, acknowledging liability for damages, said that it was no fifty-dollar dog, but a much cheaper animal. Again the court appointed experts to assess the value of the dog, three government foresters, who are supposed to know all about game and hunting and dogs, as well as all about trees. These experts, after due examination of the pedigree book, found that it was indeed not a fifty-dollar dog but a good sixty-dollar dog; and that sum, with interest from August, 1897, will form part of the working expenses of the Prussian State Railroads for the fiscal year.

Whittelsey's Train Register.

Mr. T. F. Whittelsey's train register is to be used at all of the registering stations on the Toledo & Ohio Central and the Kanawha & Michigan. Mr. Whittelsey, General Superintendent of these roads, devised this register for the purpose of keeping clean and accurate records and to obviate the well-known annoyances and dangers usually experienced with the ordinary train register. These difficulties were described in a paper read by Mr. Whittelsey before the Central Association of Railroad Officers last summer, and published in the Railroad Gazette of Aug. 5, page 566.

The new register consists of a continuous sheet of paper, wound on rollers, one of which is at the top and the other at the bottom of a box with a glass front or top. The sheet, stretched from one roller to the other, lies flat beneath the glass door and it has room for 50 entries. All of these are visible at once as on the page of an open book. At the bottom there is an opening in the glass large enough to make one entry, and each conductor, after filling a line, turns the knob so as to raise the paper one notch. The paper cannot be moved backward without first unlocking the case. Where it is desired to have the record of more than 50 trains accessible at one time, Mr. Whittelsey proposes to use two registers, one for trains in each direction. The device is made by Mr. Whittelsey, whose address is Toledo.

On the Toledo & Ohio Central the engineman is not required to examine the register. The conductor, when making his examination, fills out and signs a statement which he hands to his engineman.

C. & N. W. Home-Seekers' Ticket.

The Chicago & Northwestern is now using for its home-seekers' excursions to Colorado a modification of the Sebastian round-trip ticket, which is believed to be equally safe and a good deal more convenient. The Sebastian ticket, devised by the General Passenger Agent of the Rock Island road and patented about a year ago, is a double ticket with two contracts, the distinctive feature being that the return portion is detached by the selling agent and sent by mail to the agent at destination; the going portion, delivered to the purchaser, containing an order on the agent at destination for the delivery of the return portion. The improved form now introduced by the Northwestern is a single ticket, and the only portion sent by mail is a single supplementary contract about 6 in. long. Thus the whole of the coupons, both going and returning, are left in the hands of the passenger, which removes one cause of dissatisfaction with the double ticket. The return contract, which is sent by mail, is of no value until it is attached to the going ticket with which it belongs, and of course the main ticket is not good for the return passage until the agent at destination attaches to it the piece which he has received by mail. Home-seekers' tickets are sold to a great many destinations in Colorado, at many of which the agent has very little business, and consequently is not as skillful in dealing with complicated forms as is a joint agent at a large city.

Mr. Kniskern has sent samples of the ticket to the other lines in Western territory, and it is possible that some of them will put it in use.

Grade Crossings in Newark.

The people of Newark, New Jersey, who have long been interested in the abolition of grade crossings, the city having a large number of crossings, and some of the worst in the country, are working vigorously at Trenton for the passage by the Legislature of a general law to empower municipal governments to compel action in cases of this kind. A large delegation of the Board of Trade, with other citizens, appeared before the Committee of the Senate last week. The proposed law, introduced by Senator Ketcham, provides for the appointment of three commissioners by a court, somewhat after the plan now in vogue in Massachusetts. The law is to apply only to cities or subdivisions of cities, where the population exceeds 38 to the acre. It is proposed to assess three-fourths of the cost of alterations on the railroad and one-fourth on the city. On the 25 miles of railroad in the city of Newark there are 77 crossings, the Pennsylvania having 35 crossings in 8.7 miles, and the Delaware, Lackawanna & Western 24 crossings in 2.3 miles. At the Market street crossing of the Pennsylvania recently a count was kept for 12 hours, and it showed that 19,785 pedestrians, 895 street cars and 2,365 other vehicles crossed the railroad. The gates were closed 153 times, thus blocking the street 5 hours and 37 minutes out of the 12 hours. Similar counts were made at Broad street on the Lackawanna, and at the Mulberry street crossing of the Central. The Market Street problem is very difficult. To separate the grades the railroad will have to be elevated, but to do this it will be necessary to further elevate the track of the Central Railroad nearby, which now crosses above that of the Pennsylvania.

Railroads in China.

Minister Conger sends from Pekin, under date of December 26, 1898, a copy of a recent memorial concerning railroads, distinguishing those that are urgent and those the construction of which may be delayed. The memorial, which has received imperial sanction, reads in part:

"It was at first supposed that a speedy construction of main and branch lines of railroads would greatly benefit the Government and be a convenience to the people, and that a network of a great many roads penetrating in all directions would be of great advantage. In consideration of the present state of affairs it is necessary to decide which should have preference in time, and the memorialists request a statement of the course to be pursued.

"The Lu-Han and Hankau-Canton lines are the most important trunk lines; next in importance is the Tientsin-Chinkiang line, and Shanhaikuan, and beyond, Moukden, Niuchwang, etc., are strategical points, and roads must be built. With these exceptions other railroads are branch lines. Trunk lines are expensive in construction, and the profits are returned slowly; branch lines cost less, and profits are realized more speedily.

"The Government prefers trunk lines, in order that its orders may be speedily transmitted; the merchants, to facilitate trade, prefer branch lines.

"The Ministers have consulted concerning the building of trunk and branch lines at the same time, and think it would result in confusion; that it would be better to first build the important trunk lines, and, when a good beginning has been made, to proceed with extension."

Sleight-of-Hand Performances with Freight Cars.

It appears that the Chicago & Alton is not to have a monopoly of the glory of having a freight train play the trick of dumping one of its cars down a bank and then going on as though nothing had happened. Our readers will have seen by the daily papers that near Prentice, Ill., on Feb. 15, a car in a westbound freight train of the Alton road was derailed by the breaking of one of its wheels and fell into the ditch without the accident being discovered. The derailed car very quickly ran clear of the track and the drawbars in the adjoining cars, both front and rear, were uninjured. The train was soon stopped by the automatic application of the air brakes, but by the time the trainmen found the place where the trouble occurred, the two parts of the train had been automatically coupled, one to the other, and the train went on to Roodhouse, 34 miles, before the loss of the derailed car was discovered.

We now have a letter from an Indiana correspondent reporting almost precisely the same kind of an accident on the Richmond Division of the Pittsburgh, Cincinnati, Chicago & St. Louis on March 10. A freight train running from Walton to Anoka Junction contained a car near the middle which suddenly took a notion to jump the track; and it ran into the ditch, supposedly on account of a broken truck. The engineman had occasion to slightly slacken his speed soon after, and the rear portion ran forward and coupled itself to the front portion so quietly that no one noticed what had happened, although, as we understand it, this accident happened in broad daylight. When the train reached Logansport, five miles beyond Anoka Junction, the number taker discovered the shortage of the car, and a rancorous discussion arose between the yardmaster's clerk and the freight conductor and his brakemen. The yardmaster at Richmond was telegraphed to to see if he would swear that the car actually started, and he gave an emphatic affirmative answer. This quarrel might have gone on forever had not the section man, by this time, discovered the car in the ditch and made a report of it.

North Carolina Corporation Commission.

By a recent act of the General Assembly of North Carolina, the present Railroad Commission of that state goes out of existence on the 4th of April, and a new tribunal, to be known as the Corporation Commission, will be thereupon instituted.

It will be remembered that nearly two years ago, Gov. Russell suspended from office two of the then Railroad Commissioners, Major J. W. Wilson and Mr. S. Otho Wilson, charging that they were joint owners with the Southern Railway of a certain hotel and were otherwise disqualified to act. The matter was then laid before the Legislature, in accordance with law, and that body rendered a decision in favor of the suspended commissioners, displacing the Governor's appointees (Messrs. J. H. Pearson and L. C. Caldwell), and reinstating Major Wilson—S. Otho Wilson having resigned. Both, however, were given their pay for the period of suspension. As Major Wilson's term will expire April 1, two vacancies were caused in the old Commission, to be filled by the Legislature. S. L. Rogers succeeds S. Otho Wilson as Railroad Commissioner, and is now in office under the old law, the new one not having gone into effect. On April 1, E. C. Beddingfield (an ex-Railroad Commissioner), will succeed Major Wilson, having also been elected under the old law. Dr. D. H. Abbott, at present a member of the Commission, will go out of office when the new act takes effect, unless successful in a suit which he will institute for the purpose of retaining his place. He was elected for a six-year term, and claims that the General Assembly had no right to legislate him out of office before the expiration of said term. Frank McNeill was elected his successor. Hence the new Commission will be composed of Messrs. Frank McNeill, S. L. Rogers and E. C. Beddingfield, unless the courts hold in favor of Abbott against McNeill.

The new Corporation Commission, which will begin operations on April 4, is vested with greater power than now belongs to the Railroad Commission. Besides its supervision over railroad, steamboat, telegraph, telephone and street railway companies, the Corporation Commission will also have jurisdiction over banking and building and loan associations.

Views of Brotherhood Men on Train Work.

F. P. Sargent, grand master of the Brotherhood of Locomotive Firemen, was a witness before the Federal Industrial Commission at Washington last week. His testimony, with that of officers of other railroad brotherhoods, sent by mail, is summarized by the Associated Press as below:

The railroads do not blacklist men to-day, but when a man is employed he is required to furnish a letter from his last employer, and the operation of this system is in effect another form of blacklist No case of forcing men to work against their will

was known, except in the case in which Judge Jenkins, of Wisconsin, issued an injunction with that effect. It was recommended that some law be enacted to restrict such powers of the courts. They also recommended that the running of trains on Sunday be abolished as far as practicable. They antagonized the so-called "voluntary insurance features" of some railroads, because this insurance was, in fact, not voluntary, as the men could not get employment on the roads conducting them unless they allowed the amount of the insurance to be deducted from their wages. This insurance also relieved the employers from liability, and the money paid in as insurance was lost in case of loss of employment. Altogether the employes considered that the insurance features merely resulted in allowing the employer to dominate the actions of the employe.

In New England, Mr. Sargent said, there is very little Sunday work done in connection with the running of trains. In the West there is a great deal of Sunday work, because stockmen want their stock put into the market Monday morning. He said the railroad companies had a disposition to abolish Sunday work as far as possible, but there was a good deal of Sunday work that is demanded by the public. He said there is a great deal less Sunday traffic now than there was five years ago. Mr. Sargent said he had been the executive of his association of firemen for fourteen years, and he had never failed to satisfactorily settle any differences between the employes and their employers.

Speaking of Judge Jenkins' action in issuing an injunction, he said it had called out a spirit of rebellion on the part of the employes which threatened serious consequences. Mr. Sargent said he was served with this injunction and was restrained from counselling the men. Had that injunction not been issued there never would have been the great strike on the Northern Pacific in 1894.

Technical Schools.

University of Wisconsin.—Among the thesis subjects for the year are the following: In the Department of Civil Engineering—"A Comparison of the New York Central & Hudson River and the Pennsylvania Railroads." In the Department of Mechanical Engineering—"The Influence of Speed and Cut-off on the Cylinder Condensation of a Steam Engine;" "Microscopical and Physical Study of Iron and Steel;" "A Complete Test of the Westinghouse Air Brake." In the Department of Electrical Engineering—"Electrolytic Decomposition by the Alternating Current;" "The Comparative Electrical Conductivity of Rail Joints and Pipe Joints, Bonded and Unbonded;" "Accounting for Motive Power Costs on the Chicago, Milwaukee & St. Paul."

Washngton University, St. Louis.—Four prominent citizens of St. Louis have recently given to the University money for four new buildings, and as soon as plans have been approved work will be commenced on the buildings at the new site to which the university will be removed. This new location includes 102 acres facing Forest Park, on the western side of the city, and was presented to the university some time ago by 75 subscribers at a cost of about $200,000. The new buildings, which will all front the first quadrangle, are: (1) A recitation building, or hall of languages, to cost $200,000; given by Mr. Robert S. Brookings. (2) A building, fully equipped, for the engineering and architectural departments, to cost $150,000, the gift of Mr. Samuel Cupples. (3) A chemistry building, fully equipped, to cost $100,000; given by Mr. Adolphus Busch. (4) A library building, to cost about $100,000; to be built with the money left to the university for that purpose by the late Mr. Stephen Ridgely. In addition two dormitories are needed, one for men and one for women, and a gymnasium, all to front the second quadrangle. These, it is expected, will be given by other friends of the university. The present site of the university in the business district of St. Louis will be sold and the money added to the endowment fund. As a still larger endowment will be necessary, it is expected that $500,000 more will be raised by popular subscription. Of this amount Mr. Brookings has given $100,000 on condition that the remaining $400,000 be subscribed by others this spring. It has not yet been decided what style of architecture will be used, and plans for the new buildings and for the expenditure of the increased income have not yet ben decided on, but as the gifts already received, including the site, amount to $850,000, not counting the value of the present site, nor the $400,000 yet to be given, the university is placed on a thoroughly strong and permanent basis and a period of continued usefulness, rapid growth and great prosperity is insured to it.

The North Central Association of Colleges and Secondary Schools.—This association will meet at the Auditorium Hotel, Chicago, March 31 and April 1. Prof. J. B. Johnson, Dean of the Engineering Faculty of the University of Wisconsin, will deliver an address on "Technical Education," and Prof. Edmund J. James, University of Chicago, will give an address on "Commercial Education."

LOCOMOTIVE BUILDING.

The Buffalo, Rochester & Pittsburgh is in the market for five locomotives for quick delivery.

The Ohio Central will order three locomotives, probably from the Brooks Locomotive Works.

The Minneapolis & St. Louis has ordered 12 locomotives from the Schenectady Locomotive Works.

The Kanawha & Michigan is about to order three mogul engines from the Baldwin Locomotive Works.

The Pittsburgh Locomotive & Car Works are building one locomotive for the Monongahela River.

We are officially informed that the Michigan Central is not at present considering buying additional locomotives.

The Schenectady Locomotive Works have received an order to build eight engines for the Chemin de fer Paris á Orleans.

The Chicago, Lake Shore & Eastern has ordered two 6-wheel engines, with 19x26-in. cylinders, from the Pittsburgh Locomotive & Car Works.

The St. Joseph, South Bend & Southern has ordered one 6-wheel switching and one mogul freight engine from the Pittsburgh Locomotive & Car Works, and will order another freight engine later.

The Chicago, Rock Island & Pacific is building 16 locomotives at its Chicago shops. We now understand that the road will not order additional equipment from locomotive builders, as reported last week.

It is reported that the Chesapeake & Ohio has ordered 10 consolidation locomotives from the Richmond Locomotive & Machine Works, but we are informed that the contract has not been actually awarded.

The eight mogul engines ordered from the Richmond Locomotive & Machine Works by the Wabash, as stated in our issue of March 10, will be similar to the engines of the same type to be built by the Rhode Island Locomotive Works. They will weigh 130,000 lbs., with 110,000 lbs. on drivers.

The Rogers Locomotive Co. is building one double-end saddle-tank engine for the Payta & Piura RR. of Peru. It will have 14-in. x 24-in. cylinders; 48-in. driving wheels; boiler, 46 in. in diameter, with a working steam pressure of 150 lbs.; fireboxes, 50 in. long and 34 in. wide, of steel. The engine will weigh 75,000 lbs., with 50,000 lbs. on the driving wheels, and have a tender capacity for 1,000 gals. of water.

The Mobile & Ohio has just ordered five 10-wheel passenger and 15 10-wheel freight engines from the Rogers Locomotive Co. The passenger engines will be duplicates of those built last year for the same road and illustrated in our issue of Dec. 30. The freight engines will be the same, except that they will have 56-in. instead of 62-in. driving wheels. The 20 engines will be equipped with Latrobe tires, Coale safety valves and Nathan lubricators. The passenger engines will have Safety Car Heating & Lighting Co.'s system of steam heat. In other respects the special equipments will be as given in our issue of Dec. 30.

The two simple 10-wheel locomotives ordered early this month by the Detroit & Mackinac from the Baldwin Locomotive Works and noted in our issue of March 3, are for July delivery. They will have cylinders 18 in. x 24 in.; drivers, 65 in. in diam.; straight-top boilers; working steam pressure, 180 lbs.; fireboxes, 96 in. long and 34½ in. wide; weight on drivers, 92,000 lbs., and total weight 120,000 lbs.; tank capacity for water, 3,500 gals. Westinghouse air brakes, hammered steel axles, Sterlingworth brake beams, Congdon brake shoes, Tower couplers, Sellers injectors, Leach sanding devices, Detroit lubricators, and Crosby steam gages are specified.

CAR BUILDING.

The Columbus, Hocking Valley & Toledo is asking bids on 1,000 coal cars.

It is reported that the Chesapeake & Ohio is about to order several hundred box cars.

It is reported that the New York Central will buy 6,000 more cars. We have no official information.

It is reported that the Mobile & Ohio has ordered 140 flat cars from the Missouri Car & Foundry Co.

It is reported that the Wheeling & Lake Erie is in the market for 500 steel cars of 100,000 lbs. capacity.

We understand that the Mexican Central will place orders for some new passenger cars, probably in May.

We are reliably informed that the Minneapolis & St. Louis is preparing to buy 10 or 12 cars for passenger service.

J. H. Heimbrucher, 415 Locust St., St. Louis, will buy from 100 to 200 40-ton coal cars for a new road to be built in Illinois.

The Cold Blast Transportation Co. is considering buying some new equipment, but the plans and specifications have not yet been finished.

The Rutland is asking bids on 500 box cars, to be 34 ft. long, notwithstanding the official denial that the road intends buying new equipment.

The Huntington & Broad Top Mountain has ordered 500 coal cars of 80,000 lbs. capacity from the American Car & Foundry Co. to be built at Berwick.

The orders for cars for the Missouri, Kansas & Texas, referred to in our issue of March 10 and 17, were about to be placed as we were going to press.

One of the railroad papers last week reported that the Wisconsin Central had ordered 75 cars from Haskell & Barker, but we are officially informed that this report is incorrect.

It is reported that the Chicago & Alton will buy several thousand freight cars, part steel, and also 50 cars for passenger service. We have been unable to obtain official information.

The Wabash has placed an order with the American Car & Foundry Co. for 500 coal cars of 80,000 lbs. capacity, to be built by the Madison Car Works. Two hundred of these cars will have Kindl trucks.

The Chihuahua & Pacific has ordered the 15 flat cars noted March 10 from the Ensign Mfg. Co. These cars will be 36 ft. long and will be equipped with Westinghouse air brakes, Sterlingworth brake beams and Standard couplers.

The Chicago, Rock Island & Pacific will, it is said, build 50 box and 25 double deck stock cars at its Horton, Kan., shops. We are officially informed that the road is not building 50 passenger cars at Horton, as reported by a contemporary last week.

In reference to the report published last week by a railroad paper that the Baltimore & Ohio Southwestern has ordered 350 freight cars, we are officially informed that there is nothing in the report except that the road is trying to buy 50 standard refrigerator cars.

The 1,000 drop-bottom gondola cars for the Lake Shore & Michigan Southern, and Pittsburgh & Lake Erie (500 for each road) have been ordered from the American Car & Foundry Co., to be built at the works of the Michigan-Peninsular Car Co. They are for June and July delivery, and will be of 80,000 lbs. capacity, 35 ft. long, 9 ft. 3 in. wide, and 8 ft. 6⅞ in. high. The cars for the L. S. & M. S. will be equipped with Simplex bolsters and L. S. & M. S. standard drop doors; the specifications for the P. &. L. E. cars call for pressed steel bolsters and Simons' drop doors. In other respects, the following equipments will be used: Wrought iron axles, National hollow brake beams, Diamond S brake shoes, Westinghouse brakes, Gould couplers and draft rigging, McCord journal boxes and journal box lids, diamond trucks and L. S. & M. S. standard brasses, springs and wheels.

The St. Thomas (Ont.) Electric St. Ry. Co. wants two trailer cars. (See Electric Railroad Construction column.)

The Lynchburg (Va.) & Rivermont St. Ry. expects to buy three more motor cars. (See Electric Railroad Construction column.)

The Rome (N. Y.) City St. Ry., which is about to change to compressed air power, will want seven cars for the road. (See Electric Railroad Construction column.)

The Millford, Attleboro & Woonsocket St. Ry. Co. wants bids at once for building 20 open and 20 closed motor cars. Address Wm. H. Tylee, General Manager and Purchasing Agent, room 317, 53 State St., Boston, Mass. (See Electric Railroad Construction column.)

We are officially informed that the proposed equipment of the Waupaca (Wis.) Electric Light & Ry. is two open motor cars, two open trailer cars and one closed baggage car. W. B. Baker, Treasurer and Purchasing Agent. (See Electric Railroad Construction column.)

BRIDGE BUILDING.

ALEXANDRIA, LA.—According to report the Gulf, Louisiana & Great Northern is about to let contracts for the bridge recently authorized by Congress across the Red River. (Jan. 13, p. 31.)

BALDWINSVILLE, N. Y.—A new steel bridge will be built over Seneca River in place of the present structure.

BATAVIA, N. Y.—John W. Davis, County Auditor, will receive bids until April 12 for a steel bridge over the Big Indian Creek on the road from Moscow to Laurel. This bridge will be a single span of about 115 ft., with a roadway of 16 ft. Plans are now filed in his office in Batavia.

BUFFALO, N. Y.—The Board of Aldermen has ordered all railroad bridges over Buffalo Creek removed at the expense of railroad companies owning them, by reason of the South Buffalo flood improvements.

BUTLER, PA.—The Grand Jury has recommended a new bridge over Connoqunessing Creek in Forward Township. Enos McDonald, County Surveyor.

CHICAGO, ILL.—The bids which the Sanitary District will receive until April 10 are for two Scherzer rolling lift bridges, one a highway bridge for Taylor St., and one a railroad bridge for the Chicago Terminal Transfer RR., between Taylor St. and Twelfth St. (See Dec. 2, 1898, p. 864, and Jan. 13, p. 24.) These bridges were designed by the Scherzer Rolling Lift Bridge Co., Chicago, which will also supervise the erection, but will not bid for the work.

CHICO, CAL.—Bids are wanted by the City Clerk for a bridge over Edgar Slough, on the Chico and Dayton road.

CUMBERLAND, MD.—The Baltimore & Ohio RR., according to report, will rebuild a part of the "Cumberland Viaduct."

DEFIANCE, O.—The City Council has adopted the Wabash RR. Company's plan for a new steel overhead bridge on Raston Ave.

EXETER, N. H.—The Exeter, Hampton & Amesbury St. Ry. Co. will probably need several bridges on the proposed route. (See Electric Railroad Construction column.)

GRAND FORKS, N. D.—J. W. Scott, County Auditor, will receive bids until April 3 for all iron bridges required in the year 1899. (March 17, p. 195.)

HUNTINGTON, MASS.—The plans for the proposed change of grade crossings have been received by the Selectmen from the Boston & Albany. At the upper crossing it is intended to have the street go under the tracks, while at the lower crossing a bridge will be built.

IRONTON, O.—The Ironton & Kentucky Bridge Co. was incorporated March 11, with J. L. Anderson, E. W. Bixby, H. B. Gibbs and A. C. Campbell as directors. J. S. Anderson is President and J. F. Haver, Vice-President.

JACKSONVILLE, FLA.—In an ordinance recently approved by the City Council, the Atlantic, Valdosta & Western Ry. is required to build a new viaduct over Duval St.

LINDSAY, ONT.—The Town Clerk of Lindsay informs us that plans are being considered for a large bridge on Ridout St., but that it is not likely that it will be built this year. (March 10, p. 177.)

McMINNVILLE, TENN.—The County Bridge Committee has located one of the new county bridges ordered by the County Court a few hundred yards below Harrison's Ferry. When the location has been decided upon for the second structure, bids will probably be asked. J. C. Biles is a member of the Bridge Committee. (Feb. 3, p. 90.)

MOUNTAINSBORO, ALA.—Two bridges used by the Nashville, Chattanooga & St. Louis Ry. were washed away on March 14.

NEW KENSINGTON, PA.—The Schultz Bridge Co., of Pittsburgh, has the contract for a bridge across the Allegheny River from Ninth St. to Bouquet Station on the West Penn Railroad.

NEW YORK, N. Y.—The Board of Estimate has provided funds for the building of the new Vernon Ave. bridge over Newton Creek, Borough of Brooklyn.

The New York Legislature has passed Assemblyman E. C. Brennan's bill providing for the appointment by the Governor of a commission of six citizens of the city of New York, who shall have in charge the erection of a new bridge over the East River, from the vicinity of Fulton Ferry, in the Borough of Brooklyn, to a point opposite in the Borough of Manhattan. (March 3, p. 159.)

NORFOLK, VA.—A bridge across the Southern Branch of the Elizabeth, to connect the cities of Portsmouth and Berkeley, is proposed. H. L. Page

of Norfolk, has made application to the Secretary of War to allow the bridge to be built.

OMAHA, NEB.—Several spans of the bridge at Kearney were destroyed by high water in the Platte River March 16.

OTTAWA, ILL.—The La Salle County RR. Co., which recently secured a franchise to build through Ottawa, will build a bridge estimated to cost $22,000. (See Sycamore Electric RR. Construction column.)

ROCHESTER, N. Y.—W. E. Hoyt, Chief Engineer of the Buffalo, Rochester & Pittsburgh Ry. Co., will receive bids until April 15 for the following work in the town of Gainesville, Wyoming County: (1), Constructing a steel highway bridge 100 ft. long and 20 ft. wide at Hardy station; (2), for masonry abutments for said bridge, about 300 cu. yds.; (3), grading approaches to said bridge amounting to about 3,000 cu. yds., all work to be done according to the plans and specifications on file in his office at Rochester.

SANTA CRUZ, CAL.—The contract existing between Santa Cruz County and J. A. McMahon for building a bridge over Valencia Creek, which was altered, has been rescinded. Ed. Martin, County Clerk. (Dec. 29, 1898, p. 921.)

SAVANNAH, GA.—Two steel bridges will be built on the Augusta road, one over Dundee Canal and the other over St. Augustine Creek.

SMITHVILLE, TEX.—A $25,000 iron bridge will be built across the Colorado River at Main St.

SPRINGFIELD, MASS.—Among the improvements to be made in Springfield is a new bridge on St. James Ave., between the New England road and the B. & .

STOCKTON, CAL.—County Supervisor Newton has been instructed to prepare plans for changing the Benson Ferry bridge to a drawbridge. (Sept. 23, 1898, p. 695.)

WILBUR, WASH.—According to report, the Great Northern is surveying for a bridge across the Columbia River near Hell Gate.

WILMINGTON, DEL.—A bill has been introduced in the State Legislature permitting the Council of Wilmington to borrow $100,000 for the eliminating of grade crossings of railroads and for improvements of streets.

WOONSOCKET, R. I.—A bridge across the Blackstone River in the vicinity of the junction of High and River Sts. is proposed as an extension of Center St. A resolution has been introduced in the City Council asking for an expenditure of $30,000 for the partial rebuilding of the Globe bridge.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Canadian Pacific.—Quarterly, preferred, 2 per cent., payable April 1.

Chicago, Indianapolis & St. Louis.—Preferred, 1 per cent., payable March 30.

Chicago & Northwestern.—Quarterly, preferred, 1¾ per cent., payable April 6.

Chicago, Rock Island & Pacific.—Quarterly, 1¼ per cent., payable May 1.

New York, New Haven & Hartford.—Quarterly, 2 per cent., payable March 31.

Pacific Coast.—Annual, 1st preferred, 2½ per cent.; 2d perferred, 2 per cent.; common, 1 per cent, payable April 17.

Rio Grande Western.—Quarterly, preferred, 1¼ per cent., payable May 1.

Sunbury & Lewiston.—Semi-annual, 4 per cent., payable April 1.

United N. J. RR. & Canal.—Annual, $2.50 per share, payable April 10.

Chicago City.—Quarterly, 3 per cent., payable March 31.

Twin City Rapid Transit.—Quarterly, preferred, 1¾ per cent., payable April 1.

The Engineers' Club of Philadelphia.

A special meeting of the Club will be held on Saturday next, March 25, at 8 p. m., to discuss the present problem of the water supply of the city of Philadelphia, and prepare an address to the public.

Engineers' Club of St. Louis.

The 487th meeting was called to order at 8.20 p. m., March 15, by President Colby. Eighteen members and one visitor were present.

Plans for the celebration of the 30th anniversary of the club were discussed; details of arrangements to be left to the entertainment committee.

The paper of the evening, "Recent Concrete Construction on the Illinois and Mississippi Canal," was read by the Secretary, in the absence of the author. Mr. J. W. Woermann. The paper gave a description of the locks being built on the canal and the proportions and character of the materials used. Costs of the various items making up the total cost of two of the locks were given and comparisons made of the cost per cubic yard on this work with the cost of similar work in other parts of the country. Drawings and photographs showing the details of construction were exhibited. The discussion was participated in by Messrs. Ferguson, Dean, Colby, McMath, Ockerson.

American Street Railway Association.

President Sergeant and Secretary Penington have addressed a circular letter to exhibitors, which, after announcing that the eighteenth annual convention will be held at Tattersalls, Chicago, Oct. 17-20 next, gives in detail the arrangements which have been made by the Executive Committee for exhibits. Applications for space must be made by Sept. 1 and should be addressed to James R. Chapman, 444 North Clark street, Chicago, stating the amount of space desired. Assignments will be made as soon as possible after that date. Space will be assigned in order of application, and exhibits of like kind will be grouped together. The price of space has been fixed at 10c. a sq. ft., and no space less than 100 sq. ft. will be sold. The first floor of the building will be used for the exhibits, and cars, sweepers and plows will be placed outside. The meetings of the convention will be held on the second floor. The annual dinner will be given at the Auditorium, Friday, Oct. 20, at 7 P. M. Railroads will sell tickets on the certificate plan. (See Feb. 17, p. 130.)

PERSONAL

(For other personal mention see Elections and Appointments.)

—The engagement of Miss Mary Mallory and Mr. J. T. Harahan, Second Vice-President of the Illinois Central Railroad, is announced.

—Mr. W. M. Barrow, of Baton Rouge, La., has been appointed Secretary of the Louisiana Railroad Commission, succeeding Mr. C. J. O'Shaughnessy, resigned.

—The following gentlemen have been appointed by Governor Jones members of the Arkansas Railroad Commission for the term of two years: Mr. Robert Neill, Batesville; Mr. J. G. Wallace, Russellville, and Mr. H. M. Wells, of Monticello.

—Mr. Arthur S. C. Wurtele, who served New York State as Deputy State Engineer from August, 1887, to January, 1892, died March 20, in Albany, aged sixty-eight years. He was at one time in the operating department of the New York Central Railroad. Subsequently he was bridge engineer in the Delaware & Hudson Canal Co.

—Mr. Robert J. McClure, of Quincy, Ill., died at Miami, Fla., March 17, aged 60 years. Mr. McClure was born in England, and was for many years Consulting Engineer of the Chicago, Burlington & Quincy, and the Burlington & Missouri River railroads. In his younger years he had considerable experience as a military engineer in India and the United States.

—Prof. Walter D. Dabney, of the University of Virginia, died last week at the age of 46. Mr. Dabney was for several years the law clerk of the Interstate Commerce Commission. His book, written several years ago, on Government Regulation of Railroads, was highly esteemed by lawyers. Mr. Dabney was Solicitor of the State Department underPresident Cleveland.

—Mr. Charles Hansel has resigned as Manager of the Department of Sales and Installation of the Union Switch & Signal Co. When we went to press official action on this resignation had not been taken, but it was assumed that it would be accepted. He remains as Vice-President and General Manager of the National Switch & Signal Co., to settle up their affairs, which will proably be done by the first of May. Mr. Hansel's resignation comes about, as we understand it, simply because his private interests would not permit him to leave New York City.

—Mr. William B. Middleton, General Manager of the Taylor Iron & Steel Company, High Bridge, N. J., died at a New York hospital March 8. He was born in Philadelphia Sept. 17, 1849, and began work with the Phoenix Iron Company. He was afterwards connected with the Edge Moor Iron Works, and later was interested in the Penn Iron Company. Subsequently he was superintendent of the Pennsylvania Bolt and Nut Company, of Lebanon, Pa., and of the Allison Manufacturing Company, of Philadelphia. He became general manager of the Taylor Iron and Steel Company in 1896.

—Assistant Naval Constructor Robert B. Dashiell, U. S. N., died at his home in Washington, D. C., on March 8 of cerebro-spinal meningitis, aged 38. Mr. Dashiell was born in Maryland, and graduated from the Naval Academy as a Naval Cadet. He was widely known as an inventor and ordnance expert, and was one of the most brilliant and capable of the younger officers of the Navy. As an Ensign he had charge of the Indian Head proving ground, where he designed many improvements, while keeping up the current work of testing armor plate, projectiles and powder. Since his appointment to the Construction Corps he has made a specialty of the subject of docks, on which he had become an authority.

—Mr. Andrew Reasoner offered his resignation several months ago as Superintendent of the Morris & Essex Division of the Delaware, Lackawanna & Western, but up to now it has not been accepted. He was born in South Egremont, Mass., Jan. 4, 1823, and entered the railroad service with the New York & New Haven Railroad, in 1843. Later he was with the Hudson River Railroad, and then became Superintendent of the Long Island, and later Superintendent of the Chicago, Milwaukee & St. Paul. In 1869 he became Superintendent of Track and Construction on the Morris & Essex, and in 1871 General Superintendent of that road, which is now a division of the Delaware, Lackawanna & Western. That position he still holds.

—Mr. Edward Smith Taber, President and Treasurer of the Morse Twist Drill and Machine Company since 1868, died at his home in New Bedford, Mass., March 10, aged 73 years. He lived to see his company many times increased in size and become known throughout the world. While averse to taking upon himself the credit for this success, his associates are glad to attribute a large measure of the general prosperity of the company to his untiring efforts, his faithful activity, and his skill as a director.

His services were in demand by other business interests of New Bedford, and for many years he served as a trustee and member of the Board of Investment of the Institution for Savings, and for the past eighteen years was a director of the First National Bank, in addition to serving for the past nine years as its president. A type of the old school of business men, Mr. Taber was held in high respect and esteem not only by those associated with him, but by the community at large.

—Mr. Henry L. Goodwin, of East Hartford, Conn., died at his home in that town on March 17, at the age of 78. Mr. Goodwin went to California in 1849 and established a pony express. After he came back he was a member of the Connecticut Legislature for several terms. Mr. Goodwin was an unselfish and public-spirited citizen. For the last 20 years he had been known outside of the state chiefly on account of his constant opposition to the management of the New York, New Haven & Hartford Railroad of which company he was a stockholder. He persistently maintained that the directors were unjust in their treatment, both of the stockholders and the public, and he presented his pleas before the State Legislature and in the meetings of stockholders at every opportunity. But most or all of his claims were extravagant or fanciful, and he never secured the favor even of a small minority. In the Legislature he dealt with other than railroad questions in much the same spirit, and secured no substantial following; but on his death the members passed resolutions commending his personal character, his high principles and his devotion to what he deemed a public duty.

—Mr. William Thurston Manning, who recently resigned as Chief Engineer of the Baltimore & Ohio Railroad, was born in Alexandria, Va., Feb. 10, 1856, and entered the railroad service in 1873 as rodman of the Chicago Division of the B. & O. From then until the present time Mr. Manning has been connected in various ways with this road. From 1875 to 1880 he was Resident Engineer of the Gunpowder Tunnel, Baltimore City Water Works; Somerset & Cambria; Ohio & Baltimore Short Line; Rochester & Pittsburg and the Wheeling Division of the B. & O. In 1886 he became Superintendent, and one year later the first Engineer Maintenance of Way of the Pittsburgh Division. Mr. Manning designed the new terminals at Pittsburgh, of which he was the engineer. In 1892 he became Assistant Engineer, and the same year Acting Chief Engineer, and in 1894 Chief Engineer. Mr. Manning retains his connection with the Baltimore & Ohio as Consulting Engineer.

Mr. Manning is for the present succeeded by Major P. H. Irwin as Acting Chief Engineer, and by Mr. Daniel Willard, who has been appointed Assistant General Manager, and has charge of the Maintenance of Way Department east of the Ohio River. Mr. Willard was for 13 years on the "Soo Line" (Minneapolis, St. Paul & Saulte Ste. Marie). He went through the various grades of conductor, locomotive fireman and engineer, storekeeper, trainmaster and Superintendent. Before going to the "Soo Line" he had served with the Passumpsic and with the Lake Shore & Michigan Southern. Obviously, he must be well known to the new General Manager of the Baltimore & Ohio.

ELECTIONS AND APPOINTMENTS.

Allegheny Valley.—M. A. Carmody has been appointed Trainmaster of River Division, with headquarters at Forty-third street, Pittsburg, Pa. D. M. Dunsmore has been appointed Trainmaster of Low Grade Division, with headquarters at Reynoldsville, effective March 15.

Baltimore & Ohio.—William T. Manning, at his own request, has been relieved of the duties of Chief Engineer, but continues in the service of the company as Consulting Engineer. Major P. H. Irwin has been appointed Acting Chief Engineer, with headquarters at Mount Royal Station, Baltimore, Md.

Baltimore, Chesapeake & Atlantic.—T. A. Joynes has been appointed General Superintendent, with headquarters at Baltimore, Md.

Boise City Railway & Terminal (Oregon Short Line).—At a meeting held Feb. 20 at Boise City, Ida., the following officers were elected: President, W. D. Cornish; Vice-President and General Manager, W. H. Bancroft; Secretary and Comptroller, Chas. A. Hubbard; Treasurer, F. V. S. Crosby, and Assistant Secretary, C. E. Chrisman. At the same meeting W. H. Bancroft, Salt Lake City, Utah; Peter Sonna, Hosea E. Eastman, C. E. Chrisman, of Boise City, Ida., and W. D. Cornish, of New York, were elected Directors.

Buckeye Coal & Railway.—J. H. Winder, formerly General Manager of the Seaboard Air Line, has been appointed General Manager of the B. C. & R.

Chicago, Milwaukee & St. Paul.—The Freight and Passenger Agencies of this company have been consolidated, and George J. Lincoln, heretofore Freight Agent of the Baltimore & Ohio, will be in charge.

Chicago, Rock Island & Pacific.—At a meeting of the Directors held in New York, J. M. Johnson was elected Third Vice-President, and H. A. Parker and Tracy Dows were elected Directors, succeeding W. H. Truesdale, resigned, and David Dows, deceased.

Cleveland, Akron & Columbus.—At a meeting of the stockholders, in Cleveland, Frederick W. Whittridge, New York, was elected a Director, succeeding Calvin S. Brice, deceased. John F. McVey, L. M. Schwan and Frank Randall, of New York, were also elected Directors, succeeding Stewart M. Brice, Samuel Thomas and E. R. Thomas, resigned.

Cleveland, Cincinnati, Chicago & St. Louis.—E. O. McCormick, Passenger Traffic Manager, with headquarters at Cincinnati, O., has resigned.

Columbia Southern.—D. C. O'Reilly, who recently resigned as General Manager, has been elected Vice-President.

Dansville & Mount Morris.—M. F. Lapp, heretofore Superintendent, has been appointed General Freight and Passenger Agent, and the office of Superintendent has been abolished.

Kansas City, Pittsburgh & Gulf.—John Corcoran has been appointed Trainmaster, with headquarters at Pittsburgh, Kan.

Norfolk, Virginia Beach & Southern.—W. P. Ashburn has been appointed General Freight and Passenger Agent, to succeed Mr. R. H. Pannill, resigned.

Northern Pacific.—Daniel Boyle has been appointed Trainmaster of the Montana Division.

Ohio Southern.—C. D. Whitney has been appointed Auditor, succeeding J. Dougal, of Lima, O., resigned.

Pennsylvania Midland.—At a meeting of the stockholders the following officers were elected: President, Dr. D. P. Gerberich; Vice-President, John Bresslin; Treasurer, Wm. Bollman, and Secretary, Landis Gerberich. The Board of Directors are: Dr. D. P. Gerberich, James March, William H. Bollman, John H. Bresslin, John H. Long, John H. Uhrich and James March, Jr.

Pennsylvania Railroad.—J. L. Mohun has been appointed Assistant Master Mechanic of the Juniata shop, effective March 14.

Virginia & Southwestern.—The officers of this company, successor to the Bristol, Elizabethton & North Carolina, and the South Atlantic & Ohio, referred to in the Railroad News Column, are: President, George L. Carter; First Vice-President and Treasurer, E. R. Chapman; Vice-President, B. L. Du-

laney; Assistant Treasurer and General Manager, M. D. Chapman, and Secretary, T. F. Davis. General Manager M. D. Chapman announces the following appointments: General Superintendent, W. B. Emmert; Chief Engineer, A. B. B. Harris; Auditor, H. W. Taylor, and Master Mechanic, John King. The office of General Freight and Passenger Agent has been abolished, the General Superintendent assuming the duties of that office.

West Virginia & Pittsburgh.—E. R. Curtis has been appointed Chief Engineer, with headquarters at Weston, W. Va.

White Pass & Yukon.—E. C. Hawkins, heretofore Chief Engineer and General Superintendent, has been appointed General Manager.

RAILROAD CONSTRUCTION, New Incorporations, Surveys, Etc.

ARKANSAS NORTHWESTERN.—Locating surveys are reported in progress for the line from Stamps, Ark., northwest about 25 miles to Hope. W. I. Foster, of Hope, Ark., is President. (Feb. 24, p. 145.)

ATCHISON, TOPEKA & SANTA FE.—The Gulf, Colorado & Santa Fe line is reducing grades south of Temple, Tex., to a maximum of eight-tenths of one per cent., requiring in some places slight changes in the line. (March 10, p. 179.) Among these changes is one at Gay Hill. (Official.)

ATLANTIC & WESTERN.—This company was incorporated by the recent North Carolina Legislature with a capital stock of $50,000, which may be increased to $1,000,000, to build a line from Goldsboro west through the counties of Wayne, Johnston, Harnett, Moore and Montgomery, and thence through either Concord, Salisbury to Charlotte, to the Tennessee State line. The incorporators are: Julian S. Carr, of Durham; W. J. Edwards and W. J. Adams, of Moore County; E. T. Young, of Harnett County; J. W. Perry, of Johnston County; H. K. Borden, of Wayne County. J. W. Willis is reported to have a contract for a portion of the grading. Surveys are in progress between Southern Pines and Fayetteville.

ATLANTIC COAST LINE.—This company, according to report, is adding a second track and making other improvements at Fayetteville, N. C.

ATLANTIC, VALDOSTA & WESTERN.—The City Council at Jacksonville has granted this company an entrance into that city. (March 3, p. 160.)

BEAUFORT & PAMLICO.—This company was incorporated by the recent North Carolina Legislature, with a capital stock of $20,000, which may be increased to $100,000, to build a railroad from Bonner's Mill, on Durham Creek, a tributary of Pamlico River, south 28 miles to Wilkinson's Point on the Neuse River, with branches not to exceed 20 miles. The company is also empowered to operate steamboat lines and to own not to exceed 100,000 acres of timber lands. The incorporators are: Peter Whaley, S. H. Whaley and Wm. B. Rodman, all of the County of Beaufort. Press reports state that this road is now building and that about a mile of track is completed.

BIRMINGHAM SOUTHERN.—Surveys are to be begun soon, according to report, for this recently incorporated road, to run from Woodstock, Ala., northeast via Tannehill to Bessemer, and thence 4 or 5 miles further to Ishkooda, just south of Birmingham, to the mines recently bought by the Tennessee Coal, Iron & RR. Co. The Birmingham Southern is an incorporation of that company. (Feb. 10, p. 111.)

BLACK DIAMOND.—T. M. Dickinson, the financial agent, has returned from England to complete the legal formalities for the transfer of the franchises of this company to the British syndicate. He states that funds will be available immediately to begin building the 550 miles of road from Clay City, Ky., south to Port Royal, S. C. Col. Albert E. Boone, of Zanesville, O., the original promoter, states that the British syndicate will own every dollar of the bonds and stock. Mr. Dickinson is to return to London at once to close up the agreement. (Feb. 24, p. 145.)

CALIFORNIA ROADS.—The West Side Lumber Co., of Summerville, Cal., on the Sierra Ry., of California, has completed surveys, according to report, for a narrow-gage line south about 20 miles across the Tuolumne River to their sugar pine belt. Grading was to be begun this week.

CAPE FEAR & NORTHERN.—The General Manager, John C. Angier, of Cary, N. C., has reported that the line is to be extended from Lillington south about 20 miles to Fayetteville. It is now building from Apex, on the Seaboard Air Line, south through Williams and Blanchards to Lillington. (Jan. 13, p. 33.)

CAPE FEAR TERMINAL.—This company was incorporated by, the recent North Carolina Legislature, with a capital stock of $1,000,000, to build a line from Wilmington, south about 25 miles to Southport, and thence southeast along the Atlantic to a point on the Carolina Central or Cape Fear & Yadkin Valley, and thence north to the Virginia State line. The incorporators are: Iredell Meares, M. G. Guthrie, W. G. Curtis, William Weeks, William A. Williams and Wm. H. Green.

CHATTAHOOCHE & GULF.—This company has been incorporated in Alabama, with a capital stock of $1,000,000, to build a line from Columbia, terminus of a branch of the Central of Georgia, to run west through Henry, Geneva, Covington and Escanaba counties to Flomaton, on the Louisville & Nashville. The incorporators are: M. B. Lane, T. M. Cunningham, Jr., Isaac Haas, R. L. Pritchard, H. W. Johnson, Geo. H. Richter, H. V. Jenkins, all of Savannah, Ga.

CHICAGO & ALTON.—Engineers are at work between Bloomington, Ill., and Lincoln, preparing specifications for reductions in grades between those points. It is said that work is to be begun April 1. (March 10, p. 179.)

CHICAGO, MILWAUKEE & ST. PAUL.—Press reports say that about 20 new tracks are to be added to the yards at Portage, Wis., doubling their capacity.

CHICAGO, ROCK ISLAND & PACIFIC.—Forty miles of track is laid on the extension from Chickasha, Ind. Ter., west through Anacardo, 50 miles, and the company expects to complete the entire extension by April 1. Side tracks will be put in at the following points, distant from Chickasha as follows: Cotton Wood, nine miles; Anacardo, 18; Fort Cobb, 32; Lathran, 43; Mountain View, 50 miles. (Feb. 3, p. 92.) Grading was begun about Jan. 1. (Official.)

CHICAGO TERMINAL TRANSFER.—The question of extension from Harvey, Ill., south about 9 miles to Chicago Heights depends entirely upon securing right of way at reasonable prices. (March 17, p. 197.) No bids have been asked for grading, nor is it definitely determined whether the road will be built or not. (Official.)

CLARION.—Surveys have been completed for an extension from Hallton, Pa., southwest about 35 miles across the north end of Jefferson County, via Brookville and into Knox Township.

COLUMBUS, BLOOMINGTON & TERRE HAUTE.—Preliminary surveys are reported completed for this line from Columbus, Ind., west about 85 miles, via Bloomington to Terre Haute. Chas. W. Shaw, of Bloomington, is General Superintendent. (March 10, p. 179.)

DAVIDSON MINERAL.—This company was incorporated by the recent North Carolina Legislature, with a capital stock of $60,000, which may be increased to $100,000, to build a line from Lexington or Linwood, on the Southern, to run southeast about 35 miles to the narrows of Great Falls, on the Yadkin River, in Montgomery County. The incorporators are: Wyndham H. Wynne, Edward Hopkins, S. E. Williams and J. M. Primm.

DULUTH & NEW ORLEANS.—S. V. Wardall, of Ames, Ia., Secretary, is reported as saying that the bonds of this road have all been disposed of, and that 145 miles will be built in Iowa this spring. It is projected from Duluth, Minn., south to New Orleans, La. (July 29, 1898, p. 555.)

EAST LOUISIANA.—The citizens of Franklinton, La., have appointed a committee, of which Hon. S. P. Richardson is Chairman, to consult with the officers of the East Louisiana RR., relative to an extension of that line north 30 miles to their city.

ELIZABETH CITY & WESTERN.—This company was incorpored by the late North Carolina Legislature, with a capital stock of $100,000, which may be increased to $3,000,000, to build a road from Elizabeth City, on the Norfolk & Southern, northwest about 35 miles through the counties of Pasquotank, Perquimans and Gates to a point on the Norfolk & Carolina line of the A. C. L. The incorporators are: C. H. Robinson, G. M. Scott, J. B. Blades, J. B. Flora, W. W. Griggs, O. McMullen and E. F. Aydlett.

FORT PLAIN & RICHFIELD SPRINGS.—Surveys are reported in progress for this projected line from Richfield Springs, N. Y., to Fort Plain, 22 miles. It is stated that maps will be filed as soon as possible. Andrew R. Smith, of Springfield Center, N. Y., and Warren Hawn, of Starkville, N. Y., are Directors. Horace Moody, of 68 Broad St., New York, is Secretary. (Jan. 27, p. 72.)

FORT PAYNE & WINCHESTER.—This company has been incorporated in Alabama, with a capital stock of $100,000, to build a railroad from Fort Payne, on the Alabama Great Southern line of the Queen & Crescent, north through DeKalb and Jackson counties, Ala., and Franklin County, Tenn., to Winchester. The incorporators are: J. S. Walton, W. A. Tippin, P. H. M. Tippin, of Delta, Fla.; W. L. Morgan, H. A. Waters, F. R. Pou, of Pensacola, Fla.; L. Garza, 155 Waverly Place, New York City.

INDIANAPOLIS & LOUISVILLE.—This company was incorporated in Indiana March 20, with a capital stock of $100,000, to build the extension of the Chicago, Indianapolis & Louisville from Indianapolis southwest through Marion, Hendrick, Morgan, Putnam, Owen, Clay, Sullivan, and Greene counties, to a point at or near Loitz City, about 100 miles. The incorporators are officers and directors of the C., I. & L. (March 3, p. 161.)

KANSAS, OKLAHOMA CENTRAL & TEXAS.—This company was incorporated in Oklahoma, March 14, with a capital stock of $5,000,000, to build a railroad from Salina, Kan., south via New Kiowa, Kan., Watonga and Oklahoma City, Okla., to Denison, Tex., with a branch from Watonga, northwest through the counties of Blaine, Dewey, Day and Wood. The main line and branches will be 650 miles long. The Directors are: O. P. Hamilton, T. H. Davis, F. Hageman, Salina, Kan., G. N. Moses, Great Bend, Kan.; C. A. McBrian, C. S. Burrell, Philip Koch, Watonga, and McGregor Douglas, Oklahoma City.

KINSTON & JACKSONVILLE.—This company was incorporated by the recent North Carolina Legislature to build a line from Kinston south 40 miles via Tuckahoe, Richlands and Catharine Lake to Jacksonville. Among the incorporators are: G. W. Taylor, F. W. Harget, J. W. Burton, Frank Padrick, John F. Koonce, Frank Andrews, S. B. Taylor.

LEETONIA.—Work is reported begun getting out ties and obtaining right of way for this proposed line in Tioga County, Pa., by this recently incorporated company. C. B. Farr, of Williamsport, Pa., is President. (March 17, p. 197.)

MARSHALLTOWN & DAKOTA.—This company has been organized in Iowa to build a railroad from Story City, on the Iowa Central, about 35 miles northwest of Marshalltown, to extend northwest via Frazer, Gowrie, Manson, Pocohontas, Laurens and Hartley to Sibley, 145 miles, and thence northwest into South Dakota. It is stated that the company will immediately build from Story City to Gowrie, 45 miles. The Iowa Central is said to be back of the project. Hamilton Browne, of Marshalltown, is President.

MEXICAN ROADS.—A. W. Lilendahl, of Saltillo, Mexico, is reported to have received a concession for building a standard gage road from Saltillo west about 150 miles through the State of Coahuila to Torreon, connecting with the Mexican International and the Mexican Central. The State has given a subsidy of $75,000, and a number of merchants have made up a cash bonus exceeding $150,000.

NACOZARI.—This company has been incorporated in New Jersey, with a capital stock of $1,000,000, to build a railroad from Naco, Ariz., on the international boundary line of Mexico, to run south to Nacozari, and thence down the Yaqui River to the Gulf of California. The incorporators are: Wm. E. Dodge, Arthur Curtiss James, James Douglass and James McLean, of 11 Cliff St., New York City, and Joseph Van Vleck, of Montclair, N. J. Mr. Douglass and Mr. Van Vleck are officials of the Arizona & Southeastern, which has an extension terminating at Naco.

NEW YORK & PENNSYLVANIA.—This company has completed its extension from Oswayo, Pa., west 5.8 miles to Millport. (Dec. 16, p. 904.)

Surveys are made for an extension from Canisteo, N. Y., northwest 5 miles, to Hornellsville, but building is not yet determined upon. (Official.)

NORTHERN PACIFIC.—The Chief Engineer is reported as saying that the Cooperstown branch, from Roger, N. D. north 37 miles to Cooperstown, is to be extended about 25 miles north as soon as the snow is off the ground.

OHIO SOUTHERN.—Press reports from Ohio say that this company has decided to abandon its line from Waverly, and to build a new cut-off about 15 miles up the Scioto River, at Chillicothe, O.

PENNSYLVANIA.—Surveys have been made, according to report, on both the eastern and western banks of the Monongahela River for an extension from West Brownsville, Pa., south 52 miles, to Morgantown, W. Va. The extension may be continued, it is said, as far as Fairmount or even Clarksburg, W. Va.

Surveys are reported in progress for branch lines to certain factories in the city of Landenberg, Pa.

PENNSYLVANIA COMPANY.—Official statement is received that the Executive Committee has authorized the extension of the New Cumberland branch from the present terminus, at Kenilworth, W. Va., east to Chester, about 4 miles, and work will be begun at once. (March 3, p. 162.)

PORTLAND & ROCHESTER.—The line in the vicinity of Alfred, Me., is to be straightened this spring, according to report.

PUNGO & MATTAMUSKEET.—This company was incorporated by the recent North Carolina Legislature, with a capital stock of $3,000, which was increased to $20,000, to build a line from Makeleyville, Hyde County, to run northeast 20 miles, via Sladesville. The incorporators are: J. M. Rhodes, Asa J. Smith, P. Mulherin and G. Brinn.

SALISBURY & FAYETTEVILLE COAST LINE.—This company was incorporated by the recent North Carolina State Legislature, with a capital stock of $500,000, which may be increased to $2,000,000, to build a line from Salisbury, on the Southern, west about 200 miles, via the Yadkin Valley, Little's Mills, Fayetteville, Faison and Pink Hill to Cedar Point. The incorporators are: A. C. Manney, George Battleson and F. H. Manney.

SAND MOUNTAIN RAILROAD JOINT STOCK.—This company has been incorporated in Alabama, with a capital stock of $100,000. The commissioners were empowered to open books for subscription March 18. The incorporators are: J. W. Smith, Sylvania, Ala.; J. T. Millican, Henegar, Ala.; Hugh Marshall, Scharies, Ala.; J. D. C. Durham, Guest, Ala.; W. R. Johnson, Geraldine, Ala.; Reuben C. Davis, Lathamville, Ala.

SAVANNAH & STATESBORO.—The extension from Woodburn, Ga., northwest about 20 miles to Statesboro, is about completed. It runs in almost a direct line, with no grades or curves of account, through the small towns of Strickland, Sherwood and Nellwood. The work has been done during the last three months under the direction of the General Superintendent, W. F. Wright. (March 17, p. 198.) No securities are to be issued for the extension. (Official.)

SEATTLE & SAN FRANCISCO.—This company is reported to have control of 30,000 acres of coal land about 30 miles from Seattle, Wash., and proposes to connect the lands with the seaboard. W. E. Guerin, formerly President of the Columbus, Sandusky & Hocking, is President of the new company.

SOUTH CAROLINA & GEORGIA.—Engineers are at work locating this proposed extension from Gaffney, S. C., the terminus of the branch of the Ohio River and Charleston line, to run southwest about 20 miles to Spartanburg. (March 10, p. 180.)

SOUTHEASTERN.—This company was incorporated by the recent North Carolina Legislature, with a capital stock of $50,000, which may be increased to $500,000, to build a connecting line from Elrod, on the Atlantic Coast Line, southeast through Ashpole (now Union City), to Hub, on the A. C. L. The section from Elrod to Ashpole was completed last year, leaving about 12 miles to build.

TEXAS & PACIFIC.—Arrangements are in progress, according to report, for a connecting line from Port Allen, La., across the Mississippi River to Baton Rouge, involving from 20 to 30 miles of railroad.

TEXAS MIDLAND.—One hundred State convicts are reported at work regrading and reballasting this line from Paris, Tex. to Ennis.

TEXAS, SABINE VALLEY & NORTHWESTERN.—This company, according to report, will build a link connecting with the Marshall, Timpson & Sabine Pass. (See Railroad News column.)

TRANS-APPALACHIAN.—This company was incorporated by the recent Legislature of North Carolina, with a capital stock of $100,000, to build from a point on the Carolina Central between Shelby and Lincolnton, to run north about 75 miles through the counties of Cleveland, Lincoln, Burke, Caldwell and Mitchell to a point on either the Tennessee or Virginia State line. The incorporators are: H. L. Miller and D. W. Beach, of Washington; S. D. Dunavant, W. C. Erwin, S. T. Pearson, F. P. Tate, J. R. Erwin and W. E. Walton, of Morganton.

WABASH.—The company has $200,000 of 4 per cent. first mortgage gold bonds in reserve for building an extension from East Hannibal, Ill., to Quincy. (See Railroad News column.)

WASHINGTON & COLUMBIA RIVER.—General Manager Joseph McCabe is reported as saying that two extensions will probably be made in Washington this year, one a cut-off from Riverside east 16 miles to Waitsburg; the other an extension from Dayton northeast about 15 miles to Marengo. The surveys are completed and orders may be received at any time for beginning work.

Electric Railroad Construction.

ALLENTOWN, PA.—J. T. Hambleton informs us that the Allentown & Kutztown Traction Co., which operates two cars over about six miles of road, will be completed from Allentown to Kutztown, a distance of 20 miles, during the coming summer. The company has five cars on hand, though only operating two at present, and will receive 12 more motor cars in a few days. The officers of the company are: President, G. H. Gerber, Pottsville, Pa.; Secretary, A. R. Beers, Mauch Chunk; Treasurer, C. A. Dorney, Allentown; General Manager and Superintendent, M. M. Dreibellis; Electrician, Chas. McGovern; Chief Engineer, Thomas Schlicher. (Jan. 20, p. 54.)

AMESBURY, MASS.—Work will be begun, according to report, in about 30 days on the Amesbury & Hampton St. RR. This company was organized in the early part of February to build 4½ miles of street railroad from Amesbury. Wallace D. Lovell, 143 Federal St., Boston, is President. (See Exeter, N. H.)

ATLANTA, GA.—A contract has been awarded, according to report, to D. E. Evans & Co. of Baltimore, to build the 10 miles of new track for the Atlanta Ry. Co. The contracting company will also make the improvements on the existing lines which the railroad company was recently authorized to make. (Feb. 17, p. 132.)

AUBURN, N. Y.—A certificate by the Auburn Inter Urban Electric RR. Co. was filed with the Secretary of State March 15 for an extension of 16⅔ miles from the present end of the line in the village of Skaneateles through the towns of Onondaga, Geddes, Camillus, Marcellus and Skaneateles, all in the county of Onondaga, to connect with lines to Syracuse. President C. A. Beebe of the Auburn City Ry., practically controls the Auburn Inter Urban. (Feb. 17, p. 132.)

AUSTIN, TEX.—Work is begun, according to report, on the extension of the Austin Dam & Suburban Ry. It is expected to have the line in operation by April 1. Most of the material for this extension is bought. (April 29, 1898, p. 317.)

BOSTON, MASS.—Gov. Wolcott has approved the action of the Legislature in extending the time for building the Boston, Quincy & Fall River Bicycle Ry. until July 1900. The whole road is to be completed two years afterward. A location for this road has been granted in Boston, and surveys have been completed from Boston to Taunton. A committee consisting of Maj.-Gen. Oliver O. Howard, Chas. G. Treat, Wm. H. Thurber and others will receive sealed bids of conditional subscriptions for non-voting stock of this company. Subscriptions and contracts for building the first section have been made. The first road to be completed will be between the Boston Elevated Ry., at Harrison Ave., and Dudley St., through Quincy, Braintree, Holbrook, Brockton, Taunton and Fall River. When this is finished the extensions will be made to New Bedford, Providence, R. I., through the principal streets of Boston and adjoining cities. The prospectus explaining the plan of subscription to stock and principles of this bicycle railroad can be had from the committee at 53 State St., Boston.

BROOKFIELD, O.—The Brookfield Ry. Co. has been organized by James W. Rose, Wm. G. Rose, Reese J. Erman, John J. Davis and Thomas H. Gilliner. The road the company proposes to build is from Brookfield Township to Mahoning. The company has the right to use either steam or electricity as a motive power.

BUFFALO, N. Y.—Mr. Geo. A. Ricker, Chief Engineer of the Buffalo & Depew Ry., informs us that seven miles of double-track road is now building for the company. The officers are: Wm. B. Cutter, President; Herbert P. Bissell, Secretary. Mr. Ricker is also Chief Engineer of the Buffalo Traction Co.

CARROLLTON, KY.—We are officially informed that the name of the company which is to build the 45 miles of electric railroad between Owenton, Dallasburg, Carrollton, Milton, Ghent and Warsaw, is the Carrollton Electric Ry. & Bridge Co., which was incorporated Nov. 20 last, with a capital stock of $100,000, of which Myron I. Barker is President; James M. Gaunt, Vice-President; Martin L. Downs, Secretary; James F. Jett, Treasurer, and Geo. T. Wait, Engineer. The prospects are that contracts will be let in June. (Jan. 20, p. 54; March 3, p. 162.)

CEDAR FALLS, IA.—The Cedar Falls & Normal Ry. Co. has been incorporated in Iowa, with a capital stock of $25,000, to build about 25 miles of electric railroad in the city of Cedar Falls, and in the counties of Black Hawk, Grundy and other adjacent counties. The incorporators are: C. W. McElyea, Sarah McElyea and Jennie E. Beyer, all of Nevada, Storey county, Ia.

CHARLESTON, S. C.—By the consolidation of the various street railroads in Charleston, under the Charleston Consolidated Ry., Gas & Electric Co. of South Carolina, it is planned to use only one power house. Either the Sullivan Island's power house of the Charleston & Seashore RR., or the power house of the City Ry. Co. will be enlarged to supply sufficient power for the whole system, or a new plant will be built. (Feb. 3, p. 96.)

CHICAGO, ILL.—At a meeting of the Board of Commissioners of Cook county on March 13, an ordinance was granted the Northern Electric Co. for a part of the trolley electric road from Chicago to Elgin, Ill. The section provided for by the ordinance is in Cook county, from Seventy-second Ave. to the city limits, near Grove Ave., parallel to and south of the Chicago, Milwaukee & St. Paul right of way for one mile, and then on Grove Ave. for half a mile to the limits of the village of Garden Grove. The franchise is for 20 years and provides that the road shall be running within one year, that the service shall be half-hourly and that the company shall light intersecting streets with incandescent lights. It is said that the road to Elgin will be built by H. A. Everett, and B. Mahler, of Cleveland, and others interested in Cleveland, Ohio, suburban roads.

CLYDE, N. Y.—Chas. W. Field and Lucius L. Moses of the Clyde Electric Co., have secured right of way from Clyde north 10 miles via Rose to Bonnie Castle on Sodus Bay, for an electric railroad to reach summer resorts on Lake Ontario.

CONNELLSVILLE, PA.—The Coke Belt St. Ry. Co. was chartered March 17, to build a line 30 miles long, connecting Uniontown, Dunbar, New Haven, Connellsville, Bradford, Everson, Scottdale, Mt. Pleasant and South Greensburg, in the counties of Fayette and Westmoreland. The capital stock is $600,000. The directors are: Wm. H. Allen, (President); J. E. Weller and Bryan Robertson, Pittsburg; F. S. Young, Wilkinsburg, and D. I. Shaw, Pittsburg.

DAYTON, O.—The Dayton, Arcanum & Greenville Traction Co. is reported incorporated, with a capital stock of $10,000, to build an electric railroad between Dayton and Greenville. Among the incorporators are: J. E. Pierce, Edward H. Parrott and Solomon Good.

The National Traction Co. is reported incorporated, with a capital stock of $10,000, to build an electric railroad between Columbus, Dayton and intermediate points. The incorporators as reported are: J. Q. A. Coover, A. P. Waymire, F. L. Hutchins, all of Dayton; C. H. Allen and M. C. Reynolds, both of Columbus.

DERBY, CONN.—The Derby St. Ry. Co. has secured legislative permission to build an extension in the city of Ansonia, New Haven County. B. W. Porter, Manager.

DUNKIRK, N. Y.—Two petitions have been presented to the City Council for additional street railroads in Dunkirk. One is by Frederick H. Stevens for a 50-year franchise for a company to be known as the Dunkirk Electric Ry. Co., application being made by D. F. Toomey. The other petition is by Albert E. Nugent and Chas. D. Armstrong.

EASTON, PA.—The Worcester Construction Co., according to report, has the contract for building 4½ miles of road for the Northampton St. Ry. Co., which was chartered in the early part of this month. This road will run from Nazareth to Farmersville, where it will connect with the Easton, Palmer & Bethlehem Electric Ry. The officers and incorporators of both companies are practically the same. All the material and rolling stock is reported as having been ordered, and it is expected to have the road in operation by June 1. (March 17, p. 198.)

The Easton, Palmer & Bethlehem Electric Ry., which has already secured nearly all the right of way for the proposed road between Bethlehem and Nazareth, has made application in Easton for right of way on Northampton St., from Sixth St. to Center Square. Thomas A. H. Hay, Easton, Pa., and Chas. A. Richardson, Worcester, Mass., are the promoters of both enterprises.

The Slate Belt Electric St. Ry. Co., which proposes to build through the boroughs of Wind Gap, Pen Argyl and Bangor in Northampton county, has been granted right of way through Pen Argyl. T. A. H. Hay and Chas. A. Richardson are also interested in this company.

The Bethlehem & Freemansburg St. Ry. Co. was incorporated March 16, with a capital stock of $21,000, to build an electric railroad between Bethlehem and Butztown, about six miles. M. P. McGrath, Worcester, Mass., is President; Thomas A. H. Hay, Wm. O. Hay, James W. Fox and Chas. H. Fox are among the directors.

The Northampton Southern St. Ry. Co. was chartered March 16 to build a line six miles long, connecting Easton and Middletown. The capital stock is $36,000. The directors, Charles H Cox, (President), Bethlehem; T. A. H. Hay, W. O. Hay and James W. Fox, Easton, and M. P. McGrath, Worcester, Mass., are also connected with the other companies mentioned above, incorporated to build in Northampton county.

EAST ST. LOUIS, ILL.—Work is done and the line of the St. Louis & Belleville Electric Ry. Co. has been put in operation. The road is double track, on private right of way from East St. Louis to Belleville, 23 miles. Traffic arrangements have been made with local lines at termini which take the cars from the center of Belleville to the Eads Bridge in East St. Louis. Twelve cars are in operation. John A. Day, President of the Belleville Electric Ry., is President of this company. The power house is equipped with two St. Louis Corliss engines of 600 h. p. each, coupled direct with 425 k. w. G. E. generators and four Babcock & Wheeler boilers. (March 18, 1898, p. 209.)

ESCANABA, MICH.—Work has been begun, we are officially informed, on the 3½ miles of extension by the Escanaba Electric St. Ry. Co. (Feb. 17, p. 133.)

EXETER, N. H.—An act to incorporate the Exeter, Hampton & Amesbury St. Ry. Co. was approved Feb. 15. The company will build an electric railroad about 18 miles long from Exeter through Hampton, N. H., to Amesbury, Mass., and will establish plants for supplying electricity for heating, lighting and manufacturing in the towns of Exeter, Hampton, Hampton Falls and Seabrooke, N. H. The incorporators are: Wm. H. C. Follansby, Stephen H. Gale, Albert S. Wetherel, Albert E. McReel, Wm. Burlingame. Mr. McReel is Superintendent of the Hampton & Amesbury St. Ry., which in November last was reported building to Newburyport. (Nov. 18, 1898, p. 839.)

FLINT, MICH.—The officers of the Michigan Electric Ry. Co., which will build about 85 miles of electric railroad and do an electric lighting business, and which was mentioned in this column last week, are as follows: President and Manager, A. A. Talmage, New York; Vice-President and Purchasing Agent, Wm. J. Schaefer, New York; Secretary, Chas. A Durand, Flint; Treasurer, Matthew Davison; Superintendent and Engineer, Chas. G. Moore, both of Flint. Elmer P. Morris of New York will probably be the Electrician. (March 17, p. 198.)

FLUSHING (L. I.) N. Y.—Surveys have been begun, according to report, for a route from Flushing to White Stone by the New York & North Shore Ry. Co., the construction company which represents the New York & Queens County RR. Franchises for this road were granted the N. Y. & N. S. in Flushing in 1897.

FORT SMITH, ARK.—We are informed that work is now in progress for changing the 8⅓ miles of horse road, operated by the Fort Smith Traction Light & Power Co., into an electric line. A. N. Sicard is Secretary and Purchasing Agent. (Nov. 25, 1898, p. 853.)

FORT WAYNE, IND.—We are officially informed that the only improvements the Fort Wayne Consolidated Ry. will make this year will be about five miles of street paving, which will probably necessitate the laying of new rails. A. L. Scott, General Manager. (Feb. 24, p. 147.)

FRESNO, CAL.—The Fresno RR. Co. was incorporated March 16, with a capital stock of $500,000. The directors of the company are: Alexander Gordon, W. M. Wyatt, W. H. McKenzie, C. W. Jones and S. N. Griffith. The company will build a standard gage electric railroad in Fresno County, and will carry freight as well as passengers. The company also has the right to maintain telegraph and telephone lines. One branch of the line will run to Clovis, and together with other branches, the estimated length will be 20 miles. This project was spoken of in this column Feb. 10, p. 109.

GLENCARLYN, VA.—General Samuel S. Burdett of Glencarlyn, with others, is considering plans for an electric railroad from Arlington Junction to Fairfax Court House, and eventually to Manassas.

GRAND RAPIDS, MICH.—The Grand Rapids, Grand Haven & Muskegon Ry. Co. is the company which was incorporated March 7, with a capital stock of $100,000, to build 40 miles of electric railroad between the places named in the title. The company is preparing to make surveys and complete preliminary work for the road and for three draw and spile bridges. When this is finished contracts will be let. The officers of the company are: President, Thomas F. Carroll; Vice-President, David A. Crow, Grand Rapids; Secretary, C. W. Taylor, Detroit, and Treasurer, Joseph Kirwin. (March 3, p. 162.)

GREEN BAY, WIS.—The Fox River Electric Ry. & Power Co. filed articles of incorporation with the Secretary of State of Wisconsin, Feb. 9, with a capital stock of $150,000, as the reorganization of the Fox River Electric RR. The incorporators are: Howard S. Eldred, Albert M. Murphy and Barton L. Parker, who have acquired the property of the Fox River Electric Co., including its street railroads, electric power and light plants, all rights, privileges, etc., at public sale, Jan. 14. Several extensions are to be built this spring, and mail and express merchandise will be carried as well as passengers. (Jan. 27, p 76.)

HARTFORD, CONN.—The name of the East Hartford & Glastonbury Horse RR. Co., which is controlled by ownership of stock by the Hartford St. Ry. has been changed to the East Hartford & Glastonbury St. Ry. Co., and the company is authorized to build an extension from Glastonbury to the New London Turnpike.

HAVANA, CUBA.—On March 15 papers were filed with the Secretary of State at Trenton, N. J., increasing the capital stock of the Havana Electric Ry., from $5,000,000 to $10,000,000. (Feb. 10, p. 105; Jan. 20, p. 48.)

HELENA, MONT.—The Helena Power & Light Co. has applied to the City Council for a franchise to build the extension of 4½ miles to East Helena, which was spoken of last fall. The company also desires right to haul freight. (Dec. 2, 1898.)

HOUSTON, TEX.—At the annual meeting of the Directors of the Houston Electric St. Ry. Co. several changes among officers were made. The Board of Officers as now constituted is: President and Treasurer, A. N. Parlin; Vice-President and General Manager, H. F. MacGregor ; Secretary, F. J. DeMeritt; Assistant Treasurer, E. N. Champion; Auditor, J. W. Payne; Superintendent, E. Sells. President Parlin stated that the company will make improvements to the property as soon as money is secured to cover the cost.

INDIANAPOLIS, IND.—We are officially informed that the Indianapolis & Greenfield Rapid Transit Co., which was incorporated Feb. 1, proposes to build 30 miles of electric road between the towns of Irvington and Knightstown, passing through Cumberland, Gem, Philadelphia, Greenfield, Cleveland and Charlottsville to Knightstown. The company has already secured the necessary franchises, surveys have been completed and plans and specifications will probably be ready for bids within one week. The general office will be at Indianapolis. John J. Cooper of Indianapolis is President. Other information regarding this enterprise was given in this column under Greenfield, Feb. 10, p. 109.

JACKSONVILLE FLA.—The City Council has granted the Main St. Ry. Co. a new charter, under which the company is required to build an extension of the road. New stock will be issued to cover the cost of the improvement. S. B. Hubbard is President. (March 3, p. 162.)

KITTANNING, PA.—Work is being pushed as rapidly as the weather will permit by the Kittanning & Ford City Ry., which is building a five-mile road between Nealton and Ford City via Kittanning. The Electric Engineering & Supply Co. of Altoona has the contract. F. A. Moesta is President of the railroad company. (Jan. 20, p. 54.)

KOKOMO, IND.—The Kokomo City Ry. Co., recently sold (Feb. 3, p. 96), by Receiver, Chas. L. Harry, was bought by the Kokomo Ry. & Light Co., a new organization with an office at 44 Moffett Block, Detroit, Mich. The officers of the new company are as follows: President, Fremont Woodruff; Vice-President, Lex. J. Kirkpatrick; Secretary and Treasurer, Wm. P. Stevens; Consulting Engineer, Gilbert Wilkes; Superintendent, C. L. Harry. Mr. Kirkpatrick and Mr. Harry have their office in Kokomo, and the others in Detroit. The company proposes to build additional lines in Kokomo and the suburbs. Mr. Harry recently secured franchises for 18 miles of electric railroad between Tipton and Noblesville, Ind., which will probably be used as an extension of the present lines. (Jan. 20, p. 54; March 17, p. 199.)

We are informed that work is not yet begun on the Kokomo & Greentown Ry., of which C. L. Harry is General Manager.

LYNCHBURG, VA.—Work is begun by the Virginia Paving Brick Co., the contracting company, for rebuilding the lines of the Lynchburg Ry. & Light Co. Nearly $70,000 will be expended in improvements. R. Taylor Gleaves, President of the contracting company, is in charge of the work. (March 3, p. 163.)

We are officially informed that the Lynchburg & Rivermont St. Ry. Co. is building the extension of 1½ miles recently mentioned, and it will probably be in operation by May 1. The company expects to add three more motor cars. H. P. Woodson, President and General Manager. (Nov. 25, 1898, p. 853; March 3, p. 163.)

MILLBURY, MASS.—The Worcester & Blackstone Valley St. Ry. Co. has a franchise through Whitinsville for an extension from Rockdale. James H. Ferguson, President.

MILFORD, MASS.—Contracts will be let in a few days for building the 32 miles of electric railroad, and supplying material for the Milford, Attleboro & Woonsocket St. Ry. Co. This company was incorporated in June, 1898, with a capital stock of $200,000, and the proposed road will connect the places named in the title. Rails and rolling stock are already ordered. W. H. Tylee, General Manager of the company, has such contracts as are let. The proposed equipment is 20 open and 20 closed motor cars. The equipment of the power house will consist of two 300 k. generators; 20,000 h. p. engines, and 400 h. p. boilers. The officers of the company are: President, J. G. Ray; Vice-President, E. K. Ray; Secretary, Geo. W. Wiggins; Manager and Purchasing Agent, Wm. H. Tylee. The general office is 317, 53 State St., Boston. (Aug. 26, 1898, p. 619; Feb. 3, p. 94.)

MINEOLA (L. I.), N. Y.—The Nassau Belt Line Traction Co., with a capital stock of $300,000, was incorporated March 20, and the road to be built is to be either single or double track, and operated by electricity or compressed air, from a point near the Long Island RR. station at Mineola to Long Beach, in the town of Hempstead. A second line is proposed from Greenwich street in Hempstead to the railroad station in East Rockaway, and with various branches and spurs the road will be 30 miles long. The incorporators are: Henry L. Nichols and Fred Ingraham of Hempstead; John W. De Mott, Chas. L. Wallace and Paul K. Ames of Rockville Center; William G. Miller, Samuel R. Smith and Henry P. Libby of Freeport and Austin Cornwell of Oceanside, N. Y.

MONTVILLE, CONN.—The Montville St. Ry. Co., which was incorporated in 1898, has had the time for completing the road extended to January, 1901. The proposed route of this road is from Waterford, through Montville to Norwich. It will connect with the New London St. Ry. Co.'s tracks in New London and with the Norwich St. Ry. Co. in New London, and the cars of both these companies will be operated over the tracks of the Montville St. Ry. Co.

MORAVIA, N. Y.—The Syracuse, Skaneateles & Moravia RR. Co., which was incorporated in April, 1898, and referred to from time to time in these columns under Syracuse, N. Y., has had its articles of incorporation changed so as to permit the company to continue for 999 years. It is proposed to build 40 miles of standard gage electric railroad, the termini being Syracuse and Moravia. The names of the directors are as follows: Henry J. Hubbard, Charles R. Milford, Skaneateles; Wing T. Parker, Thos. W. Downing, Joseph Parker, John Andrews, Frank B. Ryan, H. J. Fernald, B. S. Townsend, H. N. Alley, Watson L. Van Duyne, of Moravia. (April 29, 1898, p. 317.)

NATICK, MASS.—The Natick & Cochituate St. Ry. Co., we are officially informed, will build three miles of additional road this spring. F. P. Quackenbush is Assistant Superintendent. The company is now building an extension of 3¼ miles. (Jan. 27, p. 74.)

NAZARETH, PA.—The Nazareth and Lehigh Ry. Co. was chartered March 17, with a capital stock of $10,000, to build a line one mile in length, in Northampton county. The directors are: D. C. Blair, President; C. L. Blair and J. J. Blair, Jr., New York City; G. W. Mackey and C. N. Miller, Bangor, Pa., and J. A. Miller and Conrad Miller, Nazareth.

NEW BEDFORD MASS.—Rails are now being distributed along the route of the New Bedford, Middleboro & Brockton St. Ry., under supervision of James F. Shore, Jr., Engineer. This road is to be built from Clark's Point, New Bedford, through Freetown, Lakeville and Middleboro to Bridgewater, where it will probably connect with the Brockton, Bridgewater & Taunton St. Ry., making a line of 32 miles. It is estimated that the cost of building will not exceed $300,000. Two compound condensing Green-Corliss engines of 800 h. p. each, with four large boilers, will constitute part of the equipment of the power house in Lakeville. Fred C. Hinds, of Newton, and Chas. S. Mendall, of New Bedford, are among those interested.

NEWBURYPORT, MASS.—The Newburyport & Amesbury Horse RR., which has been in the hands of W. P. Clark of Peabody as receiver, is about to be rebuilt and sufficient rails and overhead material are said to have been already secured. This company now operates about 20 miles of trolley road.

NEW ORLEANS, LA.—President T. W. Castleman is reported as stating that contracts for building and equipping the New Orleans & Jefferson RR. were let March 11 to the International Traction Co. of Detroit, Mich. The work calls for an expenditure of nearly $225,000. The road will be 8½ miles long and will connect at Atlantic Ave. with the New Orleans & Carrollton lines. A double track will be built on Napoleon Ave., to the city limits; single track to Lake City. The overhead wire will be 008 trolley wire. The power house will be supplied by four 35 h. p. motors. Both the motor and trailer cars will be equipped with air brakes of the latest pattern. The time for completing the road was recently extended by the City Council.

OAKLAND, CAL.—F. S. Douty, President of the Oakland RR., informs us that in changing the cable and horse lines to electric power the mileage is reduced. The company formerly operated both cable and electric lines on the same street. Work is now being pushed on the new power. (Sept. 2, 1898, p. 639.)

OTTAWA, ONT.—Among the improvements which the Ottawa Electric Ry. Co. is making is putting in a 1,500 h. p. dynamo which will be operated direct from six 50-inch water wheels now being installed to furnish a duplicate source of power for operating the system. The building which will contain the new machinery is built entirely of concrete and iron, and is wholly beneath the street. The entire improvements will cost about $60,000 and will be completed by June 1. The company is also considering several extensions. (Feb. 3, p. 94.)

OTTUMWA, IA.—The Ottumwa Electric & Steam Co. was incorporated in Iowa, with a capital stock of $200,000, to build an electric street railroad in the city of Ottumwa and vicinity. The company has a right to use either or both electricity and steam, and to build railroads in other parts of the State of Iowa. The directors and officers are: J. H. Merrill, President; William Daggett, Vice-President; J. B. Sax, Secretary; J. W. Garner, Treasurer; Samuel Mahon and Calvin Manning, all of Ottumwa.

PORTSMOUTH, N. H.—The selectmen of the town of Rye have granted the Portsmouth & Dover (electric) RR. right of way through that town as far as Rye Center and back by way of Foss Beach. The company must build its own culverts and bridges, and the road must be in operation by July 15. The P. & D. was formerly a part of the Boston & Maine and operated by steam. The work of changing this line to an electric road is in charge of H. Bartlett, Superintendent of Motive Power of the B. & M. (Aug. 12, 1898, p. 751.)

PROVIDENCE, R. I.—The Union Traction & Electric Co., according to report, will extend its line this spring from Westcott through Apponaug and along the shore to Rocky Point. (Jan. 20, p. 54.)

RICHMOND, IND.—Dr. G. F. Cook has been elected President of the recently incorporated Richmond, Oxford, Reilly & Cincinnati Electric Ry Co. A survey will be made at once. (Feb. 17, p. 133.)

ROME, N. Y.—We are informed that beside rebuilding the Rome City St. Ry., and equipping it with compressed air motors, the road will be extended so as to be 8½ miles long. No contracts for the work have as yet been let. It is proposed to use seven cars on the new road. (March 17, p. 199.)

ST. LOUIS, MO.—To perfect a reorganization, the name of the Wellston, Creve Coeur & St. Charles Electric RR. has been changed to the St. Louis & St. Charles Ry. Co. The franchise of the company has been amended to permit the company to lay additional track for a distance of 10,000 ft. on the north side of the St. Charles Rock Road, and work is now being pushed. J. B. Lucas is President of the company. (Feb. 17, p. 133.)

At a meeting of the stockholders of the Central Traction Co., March 13, it was decided to build at once the lines authorized by the franchises now owned by the company. The stock of the Central Traction Co. was recently bought by Brown Bros. of New York, who propose to build about 50 miles of additional road to connect the various street railroad systems in St. Louis, of which they recently secured control.

ST. THOMAS, ONT.—The St. Thomas Electric St. Ry. will build an extension of one-half mile into a park owned by the company. The company will do its own work but will receive bids on two new trailer cars. J. Edward Taylor has recently been appointed Manager.

SALT LAKE CITY, UTAH.—The Salt Lake City RR. Co. has secured material for an extension on East South Temple street, from E street to Thirteenth street east.

SANDUSKY, O.—We are officially informed that the Sandusky & Interurban Electric Ry., which was incorporated in the early part of last year, and which in July secured control of the Sandusky St. Ry., is building an interurban line from Sandusky to Lorain via Huron, Ceylon and Vermillion, about 35 miles. W. H. Price is President and Treasurer; Thomas H. Wood, Secretary and General Manager, and A. R. Thompson, Superintendent. The company now operates 9½ miles of road in the city of Sandusky, using four open and ten closed motor cars. (Oct. 14, 1898, p. 751.)

SARATOGA, N. Y.—The Saratoga Traction Co. has been granted a franchise for an extension in Ballston and is to have the new line in operation by July 1.

SPOKANE, WASH.—Secretary Chester Glass, of the City Park Transit Co., informs us that it is the intention of his company to build an extension of one mile to Coeur d'Alene Park; also, an extension of about 1½ miles to the town of Hillyard, a suburb of Spokane, making an extension at each end of the city. Contracts will be let upon the granting of a new franchise by the City Council. (March 3, p. 163.)

SPRINGFIELD, MASS.—At the monthly meeting of the Directors of the Springfield St. Ry. Co., action was taken upon the many petitions for extensions of the road. The extension between Fort Pleasant Ave. and the present terminus of the line has been decided upon, and application has already been made to the City Council.

STREATOR, ILL.—The City Council of Ottawa has granted a 20-year franchise to the LaSalle County Ry. Co., which is to build an electric railroad between Streator and Ottawa. C. H. Rathburn is one of the incorporators. (March 17, p. 199.)

SYCAMORE, ILL.—The Lake Geneva, Sycamore & Southern Electric Ry. has petitioned the supervisors of De Kalb County for permission to build through that county. The franchise asked is for 20 years and for a single track road. This company was incorporated in December, 1897, with a capital stock of $155,000. Geo. B. Morris and John B. Whalen are among those interested. (Feb. 18, 1898, p. 131.)

SYRACUSE, N. Y.—The officers of the Syracuse, Lakeside & Baldwinsville Ry., which is now building 14 miles of electric railroad between Syracuse, Lakeside, Stiles and Baldwinsville, are as follows: President, W. Judson Smith; Vice-President, Louis House; Secretary, Howard N. Babcock; Treasurer, John S. Kaufman; Superintendent and Engineer, Henry S. Newton. The general office of this company is Clinton Block, Syracuse. The Syracuse Construction Co. the owner of the electric railroad, is building the road, but has let several sub-contracts. The equipment is to be four open and eight closed motor cars, and 12 open trailer cars; two 400 k. w. Walker generators; American Wheelock engines, and B. & W. boilers are to be used as the equipment of the power house. (March 10, p. 181.)

TRENTON, N. J.—The Trenton, St. Ry. Co. has been granted the right to cross the tracks of the East Trenton branch of the Philadelphia & Reading RR., at the Brunswick Ave. crossing, Trenton, thereby permitting the extension of the road toward Lawrenceville.

UTICA, N. Y.—At the recent election of the Sanpuoit Valley Electric St. RR., which is now building a 25-mile electric road to connect suburban villages with Utica, A. P. Seaton was elected President, and Granville W. Williams, Vice-President, succeeding Mr. Seaton. (Jan. 27, p. 75.)

WAKEFIELD, MASS.—We are officially informed that locations have been granted, but no definite time has been set for building the Lawrence & Reading St. Ry., which will probably be 10 miles long, to connect the Lawrence system with the Wakefield & Lynn. Chas. F. Woodard, President.

WARSAW, IND.—Noah J. Clodfelter, President of the Indiana Traction Co. informs us that he will begin work about April 1 on the three-mile electric railroad between Warsaw and Winona Lake, Ind. (March 17, p. 199.)

WASHINGTON, D. C.—The Washington, Westminster & Gettysburg RR., which has incorporated two companies, one in Maryland and one in Pennsylvania, to build this road, will let contracts, we are informed, in a very short time for about 90 miles of road. James B. Colegrove is President of both companies. Richard M. Venable is General Manager of the Maryland company, Samuel M. Burhman, of Gettysburg, is Vice-President of the company in Pennsylvania, and Hon. Robert Snodgrass is General Counsel for the company in Pennsylvania. The company's general office is in the Atlantic Bldg., Washington, D. C. At one time it was proposed to make this a steam railroad.

The Commissioners of the District of Columbia have authorized the Washington University RR. Co. to issue bonds and stock to the amount of $175,000. This is to be a double-track road and the bond issue is to provide the means for building it. This company was incorporated July 3, 1898. (Jan. 27, p. 75; Feb. 10, p. 110.)

WAUPACA, WIS.—Irving P. Lord, President of the Waupaca Electric Light & Ry. Co., informs us that contracts will probably be let prior to May 1 for building the five miles of electric railroad between the city of Waupaca and the Wisconsin Veterans' Home and Chain o' Lakes (summer resort). Grading is nearly completed. The proposed equipment for this road is two open motor cars and two open trailer cars, and one closed baggage car, for which bids will probably be asked May 1. This company was incorporated in June last, with a capital stock of $75,000. The present officers are: President, Irving P. Lord; Vice-President, G. B. Lord; Secretary, Treasurer and Purchasing Agent, W. B. Baker; Superintendent and Electrician, J. Nanson. Electricity for operating this road is to be secured by water power. (April 1, 1898, p. 247.)

WESTERLY, R. I.—The Seaview RR., which was incorporated in 1887 to build an electric railroad about 25 miles long from Narragansett Pier to Watch Hill, passing through the towns of Westerly, Charlestown and South Kingstown, following the coast line as far as practicable, was, on March 1, granted permission to increase the capital stock by $500,000. The total capitalization of the company is now $700,000, and the time for completing the road has been extended to Dec. 1, 1900. Work is now being pushed as rapidly as possible. Among the incorporators of the company are: Isaac R. Hazard, Howard Chaplin and Herbert L. Stillman. (March 3, p. 163.)

WILMINGTON, DEL.—The Wilmington & Chester Traction Co. has completed its line between Wilmington and Chester, where it connects with other lines to form a continuous road to Philadelphia. The road was formally opened March 20. (Philadelphia, Sept. 30, 1898, p. 715.)

WINCHESTER, VA.—Walter W. Harloe, representing a Lackawanna (Pa.) coal syndicate, has secured an option on several thousand acres of land near Gurnesboro, in Bucks Creek Valley, and will build a trolley line to connect with the Cumberland Valley and the Baltimore & Ohio railroads at Stephenson.

YPSILANTI, MICH.—The Town Board of Saline has granted a franchise to Captain E. P. Allen of Ypsilanti for an extension of the proposed Ypsilanti & Saline Electric road toward Tecumseh.

GENERAL RAILROAD NEWS.

ATCHISON, TOPEKA & SANTA FE.—J. W. Davis & Co., New York, give notice to holders of the adjustment bonds of this company that the Board of Directors has expressed a willingness to adjust the interest payments on a semi-annual basis instead of an annual basis as at present followed, provided a sufficient amount of the bonds shall request this and declare their willingness to pay 1 per cent. on the par value of their bonds to cover the expenses and loss of interest.

BALTIMORE & OHIO.—Judges Goff and Morris, at Baltimore, filed a decree, March 21, foreclosing the mortgage of 1883, on the Baltimore & Philadelphia, which comprises the Baltimore Division, and ordering the sale of the same. The decree was under petition of the trustees. (March 10, p. 182.)

BROOKLYN & BRIGHTON BEACH.—This property was sold under foreclosure March 21, to ex-Lieut.-Gov. Wm. F. Sheehan for $711,000, which represents the first mortgage bonds with the accrued interest and other expenses. Mr. Sheehan is reported to have said that he bought the property in behalf of A. R. Flower, a member of the firm of Flower & Co., New York. The road went into the hands of receivers Jan. 14, 1898. (March 10, p. 181.)

CAPE FEAR & YADKIN VALLEY.—The old bonds of this company, whose property was recently sold to the Atlantic Coast Line, and now known as the Atlantic & Yadkin (Feb. 10, p. 111), are to be paid off with money deposited with the Mercantile Trust & Deposit Co., on the following basis for each $1,000 bond: A bonds, $1,043.95; B bonds, $727.25; C bonds, $661.83. The road went into the hands of receivers March 31, 1894, and was turned over to the A. C. L. on Feb. 4, last.

CENTRALIA & CHESTER.—A hearing for the sale of this road has been set for the first Monday in April before Judge Wm. J. Allen. (Dec. 9, 1898, p. 887.)

CENTRAL VERMONT.—This property was sold under foreclosure at St. Albans, Vt., March 21, to

Ezra H. Baker, of Boston, chairman of the bondholders committee, for $7,000,000. (March 10, p. 182.)

CHICAGO & ALTON.—The United States Trust Co. reports that over 70 per cent. of the $22,230,600 capital stock has accepted the terms of the agreement. The time for deposit expires on April 1. Payment to those who accepted the agreement was begun March 15. (March 10, p. 182.)

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—Persons holding bonds of the West Wisconsin line are notified to file them in the office of F. W. Oakley, Special Master of the Circuit Court of the United States for the Western District of Wisconsin, at Madison, Wis., on or before April 15.

DANVILLE & OHIO.—This company has been organized as successor to the Chicago & Ohio River, which runs from Sidell, Ill., to Olney, 85.42 miles. The property was sold Dec. 16 to the Peoria, Decatur & Evansville, which had bought the property in August, 1893, but the first sale was declared void. (Feb. 10, p. 111.)

The new company has filed a mortgage to the Central Trust Co., as trustee, to secure $1,032,000 of bonds. It has been arranged that the ownership of the property shall pass to the Cincinnati, Hamilton & Dayton, which controls the Indiana, Decatur & Western.

DOMINION ATLANTIC.—The stockholders will vote March 30 on the question of issuing an additional £100,000 of 4 per cent. second debenture stock.

HOCKING VALLEY.—This company, successor to the Columbus, Hocking Valley & Toledo, filed a mortgage at Columbus, O., on March 18, for $20,000,000, in favor of the Central Trust Co., New York. (March 10, p. 182.)

JACKSONVILLE, TAMPA & KEY WEST.—The first mortgage committee, of which Winthrop Smith, of Philadelphia, is Chairman, gives notice that a large majority of the bondholders have assented to the amended plan, and that others who assented must deposit their bonds before March 25 at 3 p. m., with the Pennsylvania Company for Insurances on Lives & Granting Annuities, of Philadelphia. It states that negotiations are pending for the sale of the bonds deposited, with prospect of success, and if such sale is consummated it is hoped that the assessments may be returned in full. (March 10, p. 182.)

KANSAS CITY, PITTSBURGH & GULF.—The reorganization committee, of which Ernest Thalmann is Chairman, gives notice that bonds may be deposited with the Mercantile Trust Co., New York, up to April 1. The reorganization plan is not yet announced. (Feb. 3, p. 95.)

MARSHALL, TIMPSON & SABINE PASS.—A controlling interest has been sold in this road, according to report, to the Texas, Sabine Valley & Northwestern. It runs from Timpson, Tex., north to Russellville, 8 miles, and is projected to run to Carthage, on the T., S. V. & N. W. The purchased company has completed 40 miles of road from Boren, Tex., north to Longview, and this line is projected from Sabine Pass north to Red River, 350 miles. About 10 miles of road will be required to complete the gap from Russellville north to Boren, and it is stated that the connection is to be made at once.

MILLEN & SOUTHWESTERN.—Press reports from Savannah, Ga., state that this property has been sold to W. M. and D. B. Durden, of Monte, Ga., and F. R. Durden, of Swainsboro. These men are already Directors or officials of the road. The line runs from Millen, Ga., to Stillmore, 32 miles, and the present company, successor to the Millen & Southern, was reorganized Oct. 28, 1897.

NEW YORK, NEW HAVEN & HARTFORD.—The time within which this company is permitted to increase its capital stock for exchanging with the shares and obligations of other railroad companies is extended from 1899 to 1910. (Dec. 16, p. 906.)

NORTHERN OF NEW JERSEY.—The bill has become a law authorizing the merging of this company into the Erie. (Feb. 10, p. 111.)

PITTSBURGH, BESSEMER & LAKE ERIE.—At a special meeting of the stockholders, called for May 5, at Pittsburgh, action is to be taken on a proposed issue of preferred stock and second mortgage bonds to fund the floating debt, and for other uses.

PORT JERVIS, MONTICELLO & NEW YORK.—This line, which runs from Port Jervis, N. Y., to Monticello, 23.75 miles, with a branch from Huguenot to Summitville, N. Y., 17.3 miles, is reported sold to a New York syndicate. The capital stock is $409,100, and the funded debt $225,000.

SHERMAN, SHREVEPORT & SOUTHERN.—The Texas Legislature has passed a bill granting the Missouri, Kansas & Texas permission to buy this road. (March 3, p. 164.)

SOUTHERN.—The Central Trust Co., of New York, will sell at a rate not to exceed par and accrued interest, enough of the Richmond & Danville equipment 5 per cent. mortgage bonds to consume not more than $50,702. Proposals will be received until March 24.

SOUTHERN PACIFIC.—The Governor of Texas has vetoed the bill authorizing the Houston & Texas Central line of the S. P. to buy and consolidate the Austin & Northwestern and other lines in Texas now operated by the S. P. Co. (Feb. 17, p. 134.)

VIRGINIA & SOUTHWESTERN.—At midnight, Jan. 31, the property of the Bristol, Elizabethton & North Carolina, 22 miles, and at midnight, Feb. 17, the property of the South Atlantic & Ohio, 71.09 miles, was taken over by the Virginia & Southwestern. The parent company was incorporated in Virginia Feb. 22, with a capital stock of $3,000,000. (March 3, p. 164. See Virginia Coal, Iron & RR., Feb. 27, p. 75.)

WABASH.—J. & W. Seligman & Co., of New York, offer for sale the $1,600,000 4 per cent. 40-year first mortgage gold bonds recently bought by them at 98 and accrued interest. The bonds will be ready for delivery March 31. In addition to this issue of $1,600,000, the company will reserve $200,000 for building a road from East Hannibal, Ill., to Quincy. (Feb. 3, p. 95.)

WHEELING & LAKE ERIE.—The Fitzgerald reorganization committee gives notice that holders of preferred or common stock who have not done so, may become parties to the plan of reorganization by making all the payments required by the terms of the plan on or before April 1. (Feb. 10, p. 111.)

WINCHESTER & POTOMAC.—This line, 32 miles long, operated for several years by the Baltimore & Ohio under lease, has been sold to Speyer & Co., New York, representatives of the B. & O., at a price said to be 10 per cent. above par on the stock. The capital stock of the company is $180,000; the first mortgage bonds, $147,250, and the second mortgage, $85,000. Possession of the property is to be taken April 1.

Electric Railroad News.

AKRON, O.—The Akron Light, Power & Traction Co., with a capital of $2,000,000, has been formed to bid in the Akron St. Railway & Illuminating Co. property at the sale March 28. Reports state that this company and the Akron & Cuyahoga Falls Rapid Transit Co. are considering plans for the consolidation of the two companies. The bondholders are offered half in cash and half in the stock of the new comanpy for their holdings. The consolidation of these two companies will form a system of 45 miles. (March 3, p. 164.)

BRADDOCK, PA.—W. L. Mellon, President of the Monongahela Street Ry., Pittsburgh, who recently bought the property of the Braddock St. Ry., held a meeting on March 20 with all the persons concerned in the purchase, for the purpose of organizing a new street railroad company. (Jan. 27, p. 76.)

BROOKLYN, N. Y.—The Brooklyn Rapid Transit Co. has, according to reports, secured a controlling interest in the stock of the Brooklyn Elevated RR. President Uhlmann is quoted as saying that the control does not involve a consolidation or merger of the companies. It does, however, comprehend the control of the latter by the transit company and a traffic agreement which will give the public all the benefits of an actual merger. The traffic agreement provides for complete harmony in operation. With the control of the elevated railroads, the Rapid Transit Co. is planning to run express trains on the elevated structures, with but few stops, to the suburbs and use the surface lines for short haul traffic, and it is calculated that with the union of these companies, a yearly saving of over $1,500,000 in the operating expenses could be made. R. P. Flower is making the negotiations.

BUFFALO, N. Y.—The International Traction Co., which will be the company after the consolidation of the street railroads of Buffalo and Niagara Falls, and the lines crossing the river into Canada, filed articles with the Secretary of State at Trenton, N. J., amending its original articles of incorporation, increasing the capital stock from $85,000 to $15,000,000. Benjamin W. Franklin, President, and Chas. McVeagh, Secretary, signed the papers. The office of the company is 60 Grand St., Jersey City, N. J. Leslie J. Hayden and Wm. H. Blain are also connected with the International Traction Co.

J. P. Morgan & Co., New York, are reported in charge of financiering the consolidation of the various street railroads which, we are officially informed, have not progressed far enough to be made public. As stated in this column last week, a new mortgage will be made for $30,000,000, of which $11,000,000 at 4 per cent. will be issued, and the remainder devoted to improvements and retiring prior liens. Reports are that J. P. Morgan & Co. have issued a call to subscribers for the payment of 80 per cent. of their subscriptions. As soon as responses to the call for subscriptions are received, the options on the stock of the various companies now held by the syndicate will be taken up and the consolidation completed. (March 3, p. 164.)

GEORGETOWN, KY.—C. H. Williams, former President and Manager of the Georgetown St. RR., has sold his interest in that company. H. P. Montgomery is now President; J. F. Groves, General Manager, and G. W. Pick remains as Engineer. The property of the G. St. RR. consists of two miles of single track, two closed and one open motor cars, one freight motor car and a power house at Cincinnati. Mr. Williams has gone to the southern part of the state to build a 45-mile electric road for freight and passenger use.

GEORGETOWN, MASS.—The Railroad Commissioners of Massachusetts have granted the petition of the Haverhill, Georgetown & Danvers St. Ry. Co., to issue $40,000 of 5 per cent. bonds. The company's capital stock is now $300,000.

IRONTON, O.—E. S. Wilson has been appointed Receiver for the Ironton Electric Light & Railway Co. The officers, under the receivership, are: General Manager, Jas. J. Walsh; Superintendent, A. Humphries, Engineer, C. W. Pease; Electrician, Allen Thuma. (March 3, p. 164.)

KANSAS CITY, MO.—Henry Pfeiffer informs us that under the plan of reorganization of the Westport & Waldo Ry., he is acting as General Manager, and the other offices have been abolished. Mr. Pfeiffer is also President and General Manager of the Kansas City & Eastern Ry.

NEWARK, N. J.—The two mortgages of the Newark & South Orange Ry. Co., amounting to $2,000,000, which were called last September for redemption, have been cancelled from record. Bonds of the North Jersey St. Ry. are now, therefore, a first mortgage on the N. & S. O. (Sept. 16, 1898, p. 680.)

NIAGARA FALLS, N. Y.—We are officially informed that Joseph R. Megrue, Receiver of the Niagara Falls & Lewiston RR., 43 Coal & Iron Exchange, Buffalo, has appointed Chas. W. Taylor as Superintendent; Geo. Garland, Auditor, and Wm. L. Marcy, Attorney for Receiver. (Feb. 24, p. 148.)

NORTH TONAWANDA, N. Y.—The Buffalo, Tonawanda & Niagara Falls Electric RR., operating about nine miles of road, is reported as having been acquired by W. Caryl Ely of the Buffalo & Lockport and the Buffalo & Niagara Falls Electric Ry., and is to form a part of the system of the street railroads in Buffalo and vicinity, now being consolidated by J. P. Morgan & Co.

PADUCAH, KY.—The Paducah St. Ry. has been reorganized under the name of the Paducah Ry. & Light Co. The officers remain the same. (Oct. 7, 1898, p. 735.)

PUEBLO, COL.—The Pueblo Electric St. Ry. Co., and the Electric Light & Power Co. have been consolidated under the name of the Pueblo Traction & Electric Co., incorporated for that purpose with a capital stock of $500,000. John F. Vail, T. H. Devine and C. E. Gast are the incorporators.

TERRE HAUTE, IND.—The Terre Haute Electric Ry., for which Joshua Jump has been Receiver, will soon be sold. The property will probably be bought in the interest of the bondholders, at a rate slightly less than 50 cents on the dollar. (Feb. 24, p. 148.)

WHEELING, W. VA.—The Wheeling Ry. Co. has absorbed the Bellaire, Bridgeport & Martins Ferry St. Ry. Co. of Bridgeport, O., which has been operating 11¼ miles of electric railroad in Bridgeport and vicinity. The company was capitalized at $150,000, and several months ago it was reported that the Wheeling Ry. had secured control, but the final arrangements, we are informed, have only recently been completed.

TRAFFIC.

Traffic Notes.

It is stated in a Western newspaper that "ordinary" sleeping cars are now run twice a week each way between Kansas City and Seattle over the Burlington and the Northern Pacific.

The St. Louis, Peoria & Northern Railway, whose lines extends from St. Louis northward to Peoria, 165 miles, announces the opening of a freight station in Chicago. The plan appears to be to run freight trains through over the Atchison, Topeka & Santa Fe between Peoria and Western Ave., Chicago, about 160 miles. The station in Chicago is at Fifth Ave. and Harrison St.

Officers of the Chesapeake & Ohio deny the report that they have been taking freight from the West to Baltimore at rates which were unjust to the Baltimore & Ohio. Rumors have been current that shipments from the West came into Baltimore by vessel from Newport News, but it is now said that the shipments which gave rise to this rumor came over the Norfolk & Western to Norfolk, which company is not in the Trunk Line Association. Moreover, it is claimed that both the Norfolk & Western and the Chesapeake & Ohio have long been authorized, by an agreement which was assented to by all interests, to make differential rates to Baltimore.

At New Orleans, March 21, the United States Circuit Court of Appeals decided against the Interstate Commerce Commission, appellant, in its suits against the Western & Atlantic Railroad, Clyde Steamship Company, Georgia Railroad, Atlanta & West Point Railroad and Western Railway of Alabama. According to the commission, in the first case the defendant roads had charged more for continuous carriage between Cincinnati and stations on the Western & Atlantic than for freight carried through to the city of Atlanta. The rate of freight to the shorter distance points, the petition claims, was discriminating in favor of Atlanta, and violative of section 4 of the act regulating commerce. The second and third suits charge similar violations. The Court held that the railroads were not obliged to obey the rule. The lower court held that the commission had no right to enforce the rule, and the Court of Appeals affirmed the decision.

Chicago Traffic Matters.

Chicago, March 22, 1899.

The transcontinental roads are having what might be called a high old time with the colonist rates. The trouble, which was started by the Great Northern announcing a flat rate of $25 from St. Paul to Pacific Coast points, has been followed by reductions to all intermediate points by both the Great Northern and the Northern Pacific. The central routes have been dragged into the war, and the low Pacific Coast rates are now being applied at all gateways. The cut between this city and San Francisco amounts to $10 a ticket, to $11.25 between New York and San Francisco, and to $7.50 from the Missouri River. A conference of the interested lines was held in this city to consider the trouble, but no action was taken on account of the absence of a representative of the Great Northern. An attempt will be made to get another meeting on the subject.

It is the general opinion among local grain shippers as well as railroad officers, that the Interstate Commerce Commission will decide that the persons who brought the Commission to Chicago to hear the complaints of alleged discrimination in export corn rates, have no case. At the last day's session of the commission one big export corn shipper after another testified that he had no complaint to make regarding the present rates on this traffic. At this session the case of Rector Walker, of Joliet, who complained that the Rock Island, the Chicago & Alton and the Santa Fe roads had discriminated against him in refusing to issue him a clergy permit for 1899, was taken up. It developed that Rector Walker had missed getting the necessary facts to make a case in law. He stated that he had applied to the defendant roads for interstate transportation, but at the same time he acknowledged that he had no intention of buying tickets nor of going on the journeys for which he requested tickets. This reduced the matter to a moot case. The commission reserved its decision in this complaint.

A meeting of the members of the Western Passenger Association is now being held in this city to consider the question of reorganizing. The roads west of the Missouri River are, for the most part, unrepresented, and it is highly unlikely that any of those lines which do not cross to this side of the river will go into any reorganization. These insist on maintaining an association of their own, with headquarters in Omaha or some place nearer the territory it may represent.

There is a chance that trouble will result from the action of the Wabash in reducing its passenger train time between Buffalo and Kansas City. The Chicago-Kansas City lines intimate that they may have to do some schedule clipping to meet the competition of the Wabash.